

KSR INSTITUTE FOR ENGINEERING AND TECHNOLOGY

TIRUCHENGODE

INNOVATION ECO SYSTEM

INDEX

| Name of the Cell / Council | Activity | Nature of Participation |
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| Research and Development | IPR | Programs for faculty |
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| Institution Innovation Council (IIC) | IIC Activities | List of Innovation Ambassadors |
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K S R INSTITUTE FOR ENGINEERING AND TECHNOLOGY
Tiruchengode-637 215
Research & Development
LIST OF PROJECT PROPOSALS SUBMITTED TO TNSCST

| S. No | Scheme / Proposal Name | Title | Student Name | Guide Name | Amount Applied |
|--------------|-------------------------------|--|--|---------------------|-----------------------|
| 1. | TNSCST | Smart Plant Monitoring System Using | Anunitha J Logeswari S Rammurugan R Swetha B | Dr. R. Jeyabharath | Rs. 10,000 |
| 2. | TNSCST | Design of Electronic Control Unit (ECU) for Battery Management System in Electrical Vehicle. | Naveen S Renugadevi N Sakthisriram A Sudhandiradhivya K | Dr. P. Veena | Rs. 10,000 |
| 3. | TNSCST | A Novel Energy Harvesting System For Electric Vehicle Using Regenerative Braking | Bharanidharan C Ragul P Vikraman M | Dr. A. Murugesan | Rs. 10,000 |
| 4. | TNSCST | Energy Management System for a Grid connected Distributed Energy Systems | Logeshwaran P Praveena M Rajachandran B Savitha R | Mr .M.A. Stephenraj | Rs. 10,000 |
| 5. | TNSCST | Renewable Energy Based Wireless Electric Vehicle Charging System | Mohankumar C Nandha Kumar L Ranjithkumar N | Ms. R. Sacithraa | Rs. 12,800 |
| 6. | TNSCST | Automatic Speed Control in Electric Vehicle with Anti-sleep Alert System | Arun Kumar P Karthikeyan S P Manisha M Nandhini M | Mr. C. Sivakumar | Rs. 10,000 |
| 7. | TNSCST | IoT Based Smart Water Bottle | Durga S Jeevanantham Singaravel Muthukumar V Vaishnavi P | Mr. T. Arvind | Rs. 10,000 |

| | | | | | |
|-----|--------|--|---|-------------------------|------------|
| 8 | TNSCST | Design and Fabrication of Solar Panel Cleaning System | G. Ajaykumar P. Boopathi V.Maruthupandi | Dr.P.Murugesan | Rs. 10,000 |
| 9 | TNSCST | Design and Fabrication of Drilling Machine | M. Santhosh M. Bharanesh T. Gokula Kannan G. Karthikeyan | Dr.P.Gopinath | Rs. 10,000 |
| 10 | TNSCST | Design and Fabrication of Pneumatic Sheet Metal Cutting Machine | M. Nandhakumar K. Nivas R V. Abishake | Dr.P.Kanakarajan | Rs. 13,400 |
| 11 | TNSCST | Design and Fabrication of Footstep Power Generator | G G Rakesh M Aravind HV HarishKumarr | Mr.P.Manikandan | Rs. 10,000 |
| 12. | TNSCST | Design and Fabrication of Solar Water Pump With Smart Time Control for Agriculture | R Vignesh S. Gokulnath M Jaichandran G Manikandan | Mr.R.Vasanthakuma r | Rs. 12,000 |
| 13. | TNSCST | Design and Fabrication of Agricultural Wheel Sprayer | S P Valliappan A. Nachiyappan P. Vignesh S Sathish Kumar | Dr.M.Sivakumar | Rs. 10,000 |
| 14. | TNSCST | Five - Axis Robotic Arm | S Karnan B Dheenadhayalan UHarish C S Mukesh Kumar | Mr.P.Chakravarthi | Rs. 10,000 |
| 15. | TNSCST | Design and Fabrication of Electric Bicycle | R Sandhiya M Deepa S Ezhilvenden R Kaviyarasu | Mr.K.Gopalakrishna n | Rs. 10,500 |
| 16. | TNSCST | Design and Fabrication of Automatic Bike Stand Slider Mechanism | P Santhosh P Harish P Kishore A Poovarasan | Mr.S.Rahul | Rs. 10,000 |

SMART PLANT MONITORING SYSTEM USING ARDUINO AND IOT

Submitted to:

TAMIL NADU STATE COUNCIL FOR SCIENCE AND TECHNOLOGY

DOTE CAMPUS, CHENNAI-600025



STUDENT PROJECT PROPOSAL



Submitted By

| | |
|--------------|------------------------|
| ANUNITHA J | (Reg.No: 731619105001) |
| LOGESWARI S | (Reg.No: 731619105010) |
| RAMMURUGAN R | (Reg.No: 731619105020) |
| SWETHA B | (Reg.No: 731619105026) |

BACHELOR OF ENGINEERING

in

ELECTRICAL AND ELECTRONICS ENGINEERING

K S R INSTITUTE FOR ENGINEERING AND TECHNOLOGY

TIRUCHENGODE-637 215



STUDENT PROJECT PROPOSAL

1. Name of the Student (s)

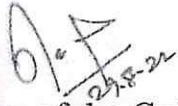
| S.No | Name of the Student | E-Mail ID | Phone No. |
|------|---------------------|--------------------------------|------------|
| 1 | Anuritha J | anurithajanakiraman@gmail.com | 8825529797 |
| 2 | Logeswari S | logeswaris2019@gmail.com | 8248725747 |
| 3 | Rammurugan R | rammurugan073@gmail.com | 9677519718 |
| 4 | Swetha B | swethabalakrishnan21@gmail.com | 9361538913 |

- 2. Name of the Guide** : Dr. R. JEYABHARATH
Department / Designation : Electrical and Electronics Engineering /
Professor
Institutional Address : K S R Institute for Engineering and Technology,
KSR kalvinagar, Tiruchengode,
Namakkal (Dt)- 637215
Tamil Nadu.
Phone No. : 04288-274773, 274741
Mobile No. : 9894913159, 9361538913
- 3. Project Title** : Smart plant monitoring system using
Arduino and IOT
- 4. Project Sector** : IOT
- 5. Project Detail** : 1.Introduction 4.Work Plan
2.Objectives 5.Budget
3.Methodology 6.Any Other Details


6. Has a similar project been carried out in your college / elsewhere? If so furnish details of the previous project and highlight the improvements suggested in the present one : No

CERTIFICATE

This is to certify that Ms. ANUNITHA J is a bonafide final year student of U.G. Engineering professional courses of our college and it is also certified that two copies of utilization certificate and final report along with seminar paper will be sent to the Council after completion of the project by the end of MAY 2023.



Signature of the Guide
P. JAYANARATH, M.E., Ph.D.,
Controller of Examinations
Professor / EEE
K.S.R. INSTITUTE FOR
ENGINEERING AND TECHNOLOGY,
TIRUCHENGODE - 637 215,
NAMARKAL DI, TAMIL NADU.



Signature of the HOD
Dr. P. VEENA, M.E., Ph.D.,
Professor & Head
Department of EEE
K.S.R. INSTITUTE FOR
ENGINEERING AND TECHNOLOGY,
TIRUCHENGODE - 637 215,
NAMARKAL DI, TAMIL NADU



Signature of the Principal/
Head of the institution

PRINCIPAL,
K S R INSTITUTE FOR
ENGINEERING AND TECHNOLOGY,
K S R KALVINAGAR,
TIRUCHENGODE - 637 215,
NAMARKAL DI, TAMIL NADU.

CERTIFICATE

To certify that Ms. LOGESWARI S is a bonafide final year student of Engineering professional courses of our college and it is also certified that copies of utilization certificate and final report along with seminar paper be sent to the Council after completion of the project by the end of MAY

[Handwritten Signature]
29/4/22

Signature of the Guide
S. HARATH, M.E., Ph.D.
In-charge of Examinations
Department of EEE
K.S.R INSTITUTE FOR
ENGINEERING AND TECHNOLOGY,
TIRUCHENGODE - 637 215,
NAMAKKAL Dt, TAMIL NADU.

[Handwritten Signature]
29/4/22

Signature of the HOD
Dr. P. VEENA, M.E., Ph.D.,
Professor & Head
Department of EEE
K.S.R INSTITUTE FOR
ENGINEERING AND TECHNOLOGY,
TIRUCHENGODE - 637 215,
NAMAKKAL Dt, TAMIL NADU.

[Handwritten Signature]
20/04/22

Signature of the Principal/
Head of the institution
PRINCIPAL,
K S R INSTITUTE FOR
ENGINEERING AND TECHNOLOGY,
K S R KALVI NAGAR,
TIRUCHENGODE-637 215,
NAMAKKAL Dt, TAMIL NADU.

CERTIFICATE

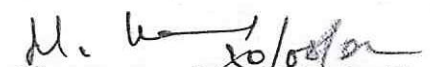
This is to certify that Ms. LOGESWARI S is a bonafide final year student of U.G. Engineering professional courses of our college and it is also certified that two copies of utilization certificate and final report along with seminar paper will be sent to the Council after completion of the project by the end of MAY 2023.


27.9.22

Signature of the Guide
G. JAYABHARATH, M.E., Ph.D.
Controller of Examinations
Professor / EEE
K.S.R. INSTITUTE FOR
ENGINEERING AND TECHNOLOGY,
TIRUCHENGODE - 637 215,
NAMAKKAL Dt, TAMIL NADU.


29/9/22


Signature of the HOD
Dr. P.VEENA, M.E., Ph.D.,
Professor & Head
Department of EEE
K.S.R INSTITUTE FOR
ENGINEERING AND TECHNOLOGY,
TIRUCHENGODE-637 215.
NAMAKKAL Dt, TAMIL NADU

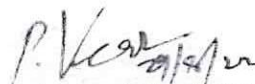

20/09/22


Signature of the Principal/
Head of the institution
PRINCIPAL,
K S R INSTITUTE FOR
ENGINEERING AND TECHNOLOGY,
K S R, KALVI NAGAR,
TIRUCHENGODE-637 215,
NAMAKKAL Dt, TAMIL NADU.

CERTIFICATE

This is to certify that Mr. RAMMURUGAN R is a bonafide final year student of U.G. Engineering professional courses of our college and it is also certified that two copies of utilization certificate and final report along with seminar paper will be sent to the Council after completion of the project by the end of MAY 2023.

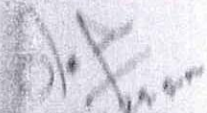

Signature of the Guide
R. J. VARHARATH, M.E., Ph.D.,
Associate Professor / EEE
K.S.R. INSTITUTE FOR
ENGINEERING AND TECHNOLOGY,
TIRUCHENGODE - 637 215,
NAMAKKAL DISTRICT, TAMIL NADU.

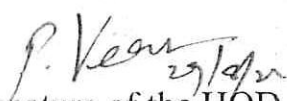

Signature of the HOD
Dr. P. VEENA, M.E., Ph.D.,
Professor & Head
Department of EEE
K.S.R. INSTITUTE FOR
ENGINEERING AND TECHNOLOGY,
TIRUCHENGODE - 637 215,
NAMAKKAL DISTRICT, TAMIL NADU



Signature of the Principal /
Head of the Institution
K.S.R. INSTITUTE FOR
ENGINEERING AND TECHNOLOGY,
K S R KALVI NAGAR,
TIRUCHENGODE - 637 215,
NAMAKKAL DISTRICT, TAMIL NADU.

CERTIFICATE

This is to certify that Ms. SWETHA B is a bonafide final year student of U.G. Engineering professional courses of our college. It is also certified that two copies of utilization certificate and final report along with seminar paper will be sent to Council after completion of the project by the end of MAY 2023.


Signature of the Guide
R. JAYASATHI, M.E., Ph.D.
Professor / EEE
K.S.R INSTITUTE FOR
ENGINEERING AND TECHNOLOGY
TIRUCHENGODE-637 215,
NAMAKKAL Dt, TAMIL NADU.


Signature of the HOD
Dr. P. VEENA, M.E., Ph.D.
Professor & Head
Department of EEE
K.S.R INSTITUTE FOR
ENGINEERING AND TECHNOLOGY
TIRUCHENGODE- 637 215
NAMAKKAL Dt, TAMIL NADU


Signature of the Principal/
Head of the Institution
K.K. S. R. INSTITUTE FOR
ENGINEERING AND TECHNOLOGY
K.K.S. R. KALVI NAGAR,
TIRUCHENGODE-637 215,
NAMAKKAL Dt, TAMIL NADU.

DESIGN OF ELECTRONIC CONTROL UNIT(ECU) FOR BATTERY MANAGEMENT SYSTEM IN ELECTRICAL VEHICLE

Submitted to

TAMIL NADU STATE COUNCIL FOR SCIENCE AND TECHNOLOGY

DOTTE CAMPUS, CHENNAI-600025



STUDENT PROJECT PROPOSAL



Submitted By

NAVEEN S

(Reg.No: 731619105016)

RENUGADEVI N

(Reg.No: 731619105022)

SAKTHISRIRAM A

(Reg.No: 731619105023)

SUDHANDIRADHIVYA K

(Reg.No: 731619105024)

BACHELOR OF ENGINEERING

in

ELECTRICAL AND ELECTRONICS ENGINEERING

K S R INSTITUTE FOR ENGINEERING AND TECHNOLOGY

TIRUCHENGODE-637 215



TAMILNADU STATE COUNCIL FOR SCIENCE AND TECHNOLOGY



STUDENT PROJECT PROPOSAL

1. Name of the Student (s) :

| S.No | Name of the Student | E-Mail ID | Phone No. |
|------|---------------------|-----------------------------|------------|
| 1 | Naveen S | naveennice604@gmail.com | 9976817810 |
| 2 | Renugadevi N | renugadevinatesan@gmail.com | 7598336152 |
| 3 | Sakthisriram A | rams49772@gmail.com | 9344361090 |
| 4 | Sudhandiradhivya K | dhivya4567890@gmail.com | 6374854699 |

2. Name of the Guide : Dr.P.VEENA

Department / Designation : Electrical and Electronics Engineering /
Professor and Head

Institutional Address : K S R Institute for Engineering and Technology,
KSR kalvinagar, Tiruchengode,
Namakkal (Dt)- 637215
Tamil Nadu.

Mobile No. : 9600343366

Guide e-mail id : veena_gce@ksriet.ac.in

3. Project Title :Design of Electronic Control Unit(ECU) for Battery Management System in electrical vehicle.

4.Sector in which your Project proposal is to be Considered :Engineering and Technology:Electrical and Electronics Engineering (EEE)

5.Project Detail :i).Introduction ii).Objectives iii).Methodology
iv).Work Plan v).Budget vi).Any Other.Details

6. Has a similar project been carried out in your college / elsewhere? If so furnish details of the previous project and highlight the improvements suggested in the present one : NO

CERTIFICATE

It is to certify that Mr. NAVEEN S is a bonafide final year student of U.G. engineering professional courses of our college and it is also certified that two copies of utilization certificate and final report along with seminar paper will be submitted to the Council after completion of the project by the end of May 2023.

P. Veena
29/4/22
Signature of the Guide

P. VEENA, M.E., Ph.D.,
Professor & Head
Department of EEE
**K.S.R INSTITUTE FOR
ENGINEERING AND TECHNOLOGY,**
TIRUCHENGODE- 637 215,
NAMAKKAL Dt, TAMIL NADU

P. Veena
29/4/22
Signature of the HOD

Dr. P. VEENA, M.E., Ph.D.,
Professor & Head
Department of EEE
**K.S.R INSTITUTE FOR
ENGINEERING AND TECHNOLOGY,**
TIRUCHENGODE- 637 215,
NAMAKKAL Dt, TAMIL NADU

M. K...
26/04/22
Signature of the Principal/
PRINCIPAL
Head of the institution

**K.S.R INSTITUTE FOR
ENGINEERING AND TECHNOLOGY,**
K S R KALVINAGAR,
TIRUCHENGODE-637 215,
NAMAKKAL Dt, TAMIL NADU.

CERTIFICATE

to certify that Ms. RENUGADEVI N is a bonafide final year student of
Engineering professional courses of our college and it is also certified that
copies of utilization certificate and final report along with seminar paper
to be sent to the Council after completion of the project by the end of May
13.

P. Veena
Signature of the Guide

P. VEENA, M.E., Ph.D.,
Professor & Head
Department of EEE
K.S.R INSTITUTE FOR
ENGINEERING AND TECHNOLOGY,
TIRUCHENGODE-637 215,
NAMAKKAL Dt, TAMIL NADU

P. Veena
Signature of the HOD

Dr. P.VEENA, M.E., Ph.D.,
Professor & Head
Department of EEE
K.S.R INSTITUTE FOR
ENGINEERING AND TECHNOLOGY,
TIRUCHENGODE-637 215,
NAMAKKAL Dt, TAMIL NADU

U. V. Srinivasan
Signature of the Principal/
Head of the institution

PRINCIPAL
K S R INSTITUTE FOR
ENGINEERING AND TECHNOLOGY,
K S R KALVI NAGAR,
TIRUCHENGODE-637 215,
NAMAKKAL Dt, TAMIL NADU.

CERTIFICATE

This is to certify that Mr. SAKTHISRIRAM A is a bonafide final year student of U.G. Engineering professional courses of our college and it is also certified that two copies of utilization certificate and final report along with seminar paper will be sent to the Council after completion of the project by the end of May 2023.

P. Veena
Signature of the Guide

Dr. RVEENA, M.E., Ph.D.,
Professor & Head
Department of EEE
K.S.R INSTITUTE FOR
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TIRUCHENGODE- 637 215,
NAMAKKAL DI, TAMIL NADU

P. Veena
Signature of the HOD


Dr. RVEENA, M.E., Ph.D.,
Professor & Head
Department of EEE
K.S.R INSTITUTE FOR
ENGINEERING AND TECHNOLOGY,
TIRUCHENGODE- 637 215,
NAMAKKAL DI, TAMIL NADU

M. Veena
Signature of the Principal/
Head of the institution

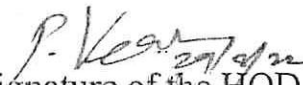
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K.S.R INSTITUTE FOR
ENGINEERING AND TECHNOLOGY,
K S R KALVI NAGAR,
TIRUCHENGODE-637 215,
NAMAKKAL DI, TAMIL NADU.

CERTIFICATE

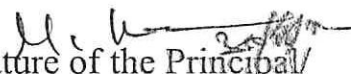
This is to certify that Ms. SUDHANDIRADHIVYA K is a bonafide final year student of U.G. Engineering professional courses of our college and it is also certified that two copies of utilization certificate and final report along with seminar paper will be sent to the Council after completion of the project by the end of May 2023.


Signature of the Guide

R.VEENA, M.E., Ph.D.,
Professor & Head
Department of EE
K.S.R INSTITUTE FOR
ENGINEERING AND TECHNOLOGY,
TIRUCHENGODE
NAMAKKAL Dt, TAMIL NADU


Signature of the HOD

Dr. R.VEENA, M.E., Ph.D.,
Professor & Head
Department of EE
K.S.R INSTITUTE FOR
ENGINEERING AND TECH
TIRUCHENGODE- 637
NAMAKKAL Dt, TAMIL NADU


Signature of the Principal
Head of the Institution

PRINCIPAL
K S R INSTITUTE FOR
ENGINEERING AND TECHNOLOGY,
K S R KALVINAGAR,
TIRUCHENGODE-637 215,
NAMAKKAL Dt, TAMIL NADU.

A NOVEL ENERGY HARVESTING SYSTEM FOR ELECTRIC VEHICLE USING REGENERATIVE BRAKING

Submitted to

TAMIL NADU STATE COUNCIL FOR SCIENCE AND TECHNOLOGY

DOTE CAMPUS, CHENNAI-600025



STUDENT PROJECT PROPOSAL



Submitted By

BHARANIDHARAN C (Reg.No: 731619105003)

RAGUL P (Reg.No: 731619105018)

VIKRAMAN M (Reg.No: 731619105032)

BACHELOR OF ENGINEERING

in

ELECTRICAL AND ELECTRONICS ENGINEERING

K S R INSTITUTE FOR ENGINEERING AND TECHNOLOGY

TIRUCHENGODE-637 215



TAMILNADU STATE COUNCIL FOR SCIENCE AND TECHNOLOGY



STUDENT PROJECT PROPOSAL

1. Name of the Student (s) :

| S.No | Name of the Student | E-Mail ID | Phone No. |
|------|---------------------|------------------------|------------|
| 1 | Bharanidharan C | cbharani9080@gmail.com | 9080178860 |
| 2 | Ragul P | ragulp23@gmail.com | 6380256933 |
| 3 | Vikraman M | vikramanmmu@gmail.com | 6381832199 |

2. Name of the Guide : Dr.A. MURUGESAN

Department / Designation : Electrical and Electronics Engineering /
Associate Professor

Institutional Address : K S R Institute for Engineering and Technology,
KSR Kalvi Nagar, Tiruchengode,
Namakkal (Dt)- 637215
Tamil Nadu.

Phone No. : 04288-274773, 274741

Mobile No. : 9952162179, 7010561 171

Guide e-mail id : murugesan.a@gmail.com

3. Project Title : A Novel Energy Harvesting System For Electric
Vehicle Using Regenerative Braking

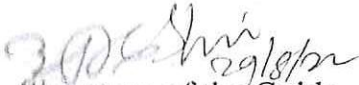
4. Sector in which your Project proposal is to be Considered : Engineering and Technology:Electrical and
Electronics Engineering (EEE)

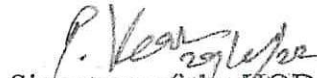
5. Project Detail : i).Introduction ii).Objectives iii).Methodology
iv).Work Plan v).Budget vi).Any Other Details


6. Has a similar project been carried out in your college / elsewhere? If so furnish details of the previous project and highlight the improvements suggested in the present one : NO

CERTIFICATE

This is to certify that Mr. BHARANIDHARAN C is a bonafide final year student of U.G. Engineering professional courses of our college and it is also certified that two copies of utilization certificate and final report along with seminar paper will be sent to the Council after completion of the project by the end of May 2023.


Signature of the Guide


Signature of the HOD



Signature of the Principal
Head of the institution


HEAD OF THE DEPARTMENT,
DEPARTMENT OF EEE.,
K S R INSTITUTE FOR
ENGINEERING AND TECHNOLOGY,
TIRUCHENGODE-637 215.

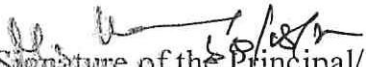
K S R INSTITUTE FOR
ENGINEERING AND TECHNOLOGY,
K S R, KALVI NAGAR,
TIRUCHENGODE-637 215.
KAMAKKAL Dt. TAMIL NADU

CERTIFICATE

This is to certify that Mr. RAGUL P is a bonafide final year student of U.G. Engineering professional courses of our college and it is also certified that two copies of utilization certificate and final report along with seminar paper will be sent to the Council after completion of the project by the end of May 2023.


Signature of the Guide


Signature of the HOD

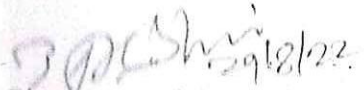

Signature of the Principal/


HEAD OF THE DEPARTMENT
DEPARTMENT OF EEE,
K S R INSTITUTE FOR
ENGINEERING AND TECHNOLOGY
TIRUCHENGODE-637 215

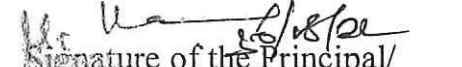
PRINCIPAL
K S R INSTITUTE FOR
ENGINEERING AND TECHNOLOGY,
K S R KALVINAGAR,
TIRUCHENGODE-637 215,
NAIRAKKAL DI, TAMIL NADU.

CERTIFICATE

This is to certify that **Mr. VIKRAMAN M** is a bonafide final year student of U.G. Engineering professional courses of our college and it is also certified that two copies of utilization certificate and final report along with seminar paper will be sent to the Council after completion of the project by the end of May 2023.


Signature of the Guide


Signature of the HOD


Signature of the Principal/
Head of the institution
PRINCIPAL
K S R INSTITUTE FOR
ENGINEERING AND TECHNOLOGY,
K S R KALVI NAGAR,
TIRUCHENGODE-637 215,
NAMAKKAL DI, TAMIL NADU.

HEAD OF THE DEPARTMENT,
DEPARTMENT OF EEE.,
K S R INSTITUTE FOR
ENGINEERING AND TECHNOLOGY,
TIRUCHENGODE-637 215.

**Energy Management System for a Grid Connected
Distributed Energy Sources**

Submitted to

TAMIL NADU STATE COUNCIL FOR SCIENCE AND TECHNOLOGY

DOVE CAMPUS, CHENNAI-600025



STUDENT PROJECT PROPOSAL



Submitted By

LOGESHWARAN P (Reg.No: 731619105009)

PRAVEENA M (Reg.No: 731619105017)

RAJACHANDRAN B (Reg.No: 731619105019)

SAVITHA R (Reg.No: 731619105301)

BACHELOR OF ENGINEERING

in

ELECTRICAL AND ELECTRONICS ENGINEERING

K S R INSTITUTE FOR ENGINEERING AND TECHNOLOGY

TIRUCHENGODE-637 215



STUDENT PROJECT PROPOSAL

1. Name of the Student (s)

| S.No | Name of the Student | E-Mail ID | Phone No. |
|------|---------------------|---------------------------------------|------------|
| 1 | Eegeshwaran P | logeshwaran4285@gmail.com | 6637414462 |
| 2 | Praveena M | praveenamathesh261@gmail.com | 9944128029 |
| 3 | Rajachandran B | rajachandranrajachandran007@gmail.com | 796398287 |
| 4 | Savitha R | rasavitha01@gmail.com | 9944128029 |

2. Name of the Guide : Mr.M.A.STEPHENRAJ M.E

Department / Designation : Electrical and Electronics Engineering / Assistant Professor

Institutional Address : K S R Institute for Engineering and Technology,
KSR kalvinagar, Tiruchengode,
Namakkal (Dt)- 63721 5
Tamil Nadu.

Phone No. : 04288-274773, 27474 1

Mobile No. : 9944128029, 9360608166

Guide e-mail id : stephen1987.raj@gmail.com

3. Project Title : Energy Management System for a Grid connected Distributed Energy Sources

4. Sector in which your Project proposal is to be Considered : Engineering and Technology/Electrical and Electronics Engineering (EEE)

5. Project Detail : i).Introduction ii).Objectives iii).Methodology iv).Work Plan v).Budget vi).Any Other Details

6. Has a similar project been carried out in your college / elsewhere? If so furnish details of the previous project and highlight the improvements suggested in the present work.

CERTIFICATE

This is to certify that Mr. LOGESHWARAN P is a bonafide final year student of U.G. Engineering professional courses of our college and it is also certified that two copies of utilization certificate and final report along with seminar paper will be sent to the Council after completion of the project by the end of May 2023.

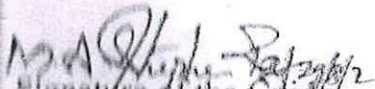
M. A. Srinivasan
29/12/22
Signature of the Guide

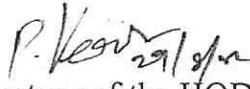
P. Veera
29/12/22
Signature of the HOD,
HEAD OF THE DEPARTMENT
DEPARTMENT OF EEE.,
K S R INSTITUTE FOR
ENGINEERING AND TECHNOLOGY,
TIRUCHENGODE-637 215.

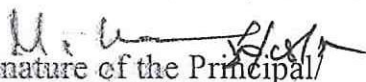
U. V. Srinivasan
29/12/22
Signature of the Principal/
Head of the institution
PRINCIPAL
K S R INSTITUTE FOR
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K S R KALVINAGAR,
TIRUCHENGODE-637 215,
NAMAKKAL DI. TAMILNADU.

CERTIFICATE

This is to certify that Ms. PRAVEENA M is a bonafide final year student of U.G. Engineering professional courses of our college and it is also certified that two copies of utilization certificate and final report along with seminar paper will be sent to the Council after completion of the project by the end of May 2023.


Signature of the Guide


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HEAD OF THE DEPARTMENT,
DEPARTMENT OF EEE.,
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ENGINEERING AND TECHNOLOGY,
TIRUCHENGODE-637 215.


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Head of the Institution
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K S R INSTITUTE FOR
ENGINEERING AND TECHNOLOGY,
K S R KALVINAGAR,
TIRUCHENGODE-637 215,
NAMAKKAL DL, TAMIL NADU

CERTIFICATE

This is to certify that Mr. RAJACHANDRAN B is a bonafide final year student of U.G. Engineering professional courses of our college and it is also certified that two copies of utilization certificate and final report along with seminar paper will be sent to the Council after completion of the project by the end of May 2023.

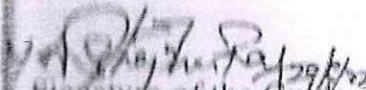
[Signature]
Signature of the Guide

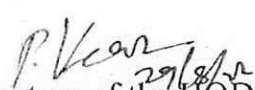
[Signature]
Signature of the HOD
HEAD OF THE DEPARTMENT,
DEPARTMENT OF EEE.,
K S R INSTITUTE FOR
ENGINEERING AND TECHNOLOGY,
TIRUCHENGODE-637 215.

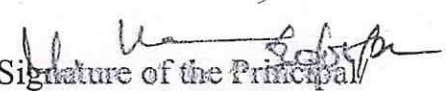
[Signature]
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Head of the Institution
PRINCIPAL
K S R INSTITUTE FOR
ENGINEERING AND TECHNOLOGY,
K S R KALVI NAGAR,
TIRUCHENGODE-637 215,
NAMAKKAL DI, TAMIL NADU.

CERTIFICATE

This is to certify that Ms. SAVITHA R is a bonafide final year student of U.G. Engineering professional courses of our college and it is also certified that two copies of utilization certificate and final report along with seminar paper will be sent to the Council after completion of the project by the end of May 2023.


Signature of the Guide


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DEPARTMENT OF EEE.,
K S R INSTITUTE FOR
ENGINEERING AND TECHNOLOGY,
TIRUCHENGODE-637 215.


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Head of the Institution
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K S R INSTITUTE FOR
ENGINEERING AND TECHNOLOGY,
K S R KALVI NAGAR,
TIRUCHENGODE-637 215,
NAMAKKAL DI, TAMIL NADU.

RENEWABLE ENERGY BASED WIRELESS ELECTRIC VEHICLE CHARGING SYSTEM

Submitted to

TAMIL NADU STATE COUNCIL FOR SCIENCE AND TECHNOLOGY

DOTE CAMPUS, CHENNAI-600025



STUDENT PROJECT PROPOSAL



Submitted By

MOHANKUMAR C (Reg.No: 731619105012)

NANDHA KUMAR L (Reg.No: 731619105014)

RANJITHKUMAR N (Reg.No: 731619105021)

BACHELOR OF ENGINEERING

in

ELECTRICAL AND ELECTRONICS ENGINEERING

K S R INSTITUTE FOR ENGINEERING AND TECHNOLOGY

TIRUCHENGODE-637 215



TAMILNADU STATE COUNCIL FOR SCIENCE AND TECHNOLOGY



STUDENT PROJECT PROPOSAL

1. Name of the Student (s) :

| S.No | Name of the Student | E-Mail ID | Phone No. |
|------|---------------------|-----------------------------|------------|
| 1 | MOHANKUMAR C | deepamohan774@gmail.com | 9688412389 |
| 2 | NANDHA KUMAR L | nandhakumarlk65@gmail.com | 9344735390 |
| 3 | RANJITHKUMAR N | ranjithkumar49219@gmail.com | 8489219528 |

One valid E-mail id : sacithraar@ksriet.ac.in

2. Name of the Guide : Ms. SACITHRAA R

Department / Designation : Electrical and Electronics Engineering /
Assistant Professor

Institutional Address : K S R Institute for Engineering and Technology,
KSR kalvinagar, Tiruchengode,
Namakkal (Dt)- 637215
Tamil Nadu.

Phone No. : 04288-274773, 274741

Mobile No. : 9944128029, 9360608166

3. Project Title : Renewable Energy Based Wireless Electric Vehicle
Charging System

4. Project Sector : Electrical And Electronics Engineering
(EEE)

5. Project Detail : 1).Introduction 2).Objectives 3).Methodology
4).Work Plan 5).Budget 6).Any Other Details

6. Has a similar project been carried out in your college / elsewhere? If so furnish details of the previous project and highlight the improvements suggested in the present one : NO

CERTIFICATE

This is to certify that Mr./Miss. MOHAN KUMAR C is a bonafide final year student of P.G. Science / U.G. Engineering / P.G. Professional courses of our college and it is also certified that two copies of utilization certificate and final report along with seminar paper will be sent to the Council after completion of the project by the end of May 2023.

P. Veena
29/4/22
Signature of the Guide

P. Veena
29/4/22
Signature of the HOD
Dr. P.VEENA, M.E., Ph.D.,
Professor & Head
Department of EEE
K.S.R INSTITUTE FOR
ENGINEERING AND TECHNOLOGY
TIRUCHENGODE-637 215,
NAMAKKAL Dt, TAMIL NADU

M. V. Srinivasan
29/4/22
Signature of the Principal/
PRINCIPAL
K S R INSTITUTE FOR
ENGINEERING AND TECHNOLOGY,
K. S. R. KALVI NAGAR,
TIRUCHENGODE-637 215,
NAMAKKAL Dt, TAMIL NADU.
Head of the Institution
(with seal)

CERTIFICATE

This is to certify that Mr./Miss. NANDHA KUMAR I is a bonafide final year student of B.G. Science / UG. Engineering / P.G. Professional courses of our college and it is also certified that two copies of utilization certificate and final report along with ~~examiner paper~~ will be sent to the Council after completion of the project by the end of May 2023.

b.a. 2020
Signature of the Guide

P. Veera
Signature of the HOD

Dr. P. VEENA, M.E., Ph.D.,
Professor & Head
Department of EEE
K.S.R. INSTITUTE FOR
ENGINEERING AND TECHNOLOGY,
TIRUCHENGODE - 637 215,
NAMAKKAL Dt., TAMIL NADU

M. U. Srinivasan
Signature of the Principal
PRINCIPAL
K S R INSTITUTE FOR
ENGINEERING AND TECHNOLOGY,
Head of the Institution
TIRUCHENGODE - 637 215,
NAMAKKAL Dt., TAMIL NADU.
(with seal)

CERTIFICATE

This is to certify that Mr./Miss. RANJITH KUMAR N is a bonafide final year student of P.G. Science U.G. Engineering P.G. Professional courses of our college and it is also certified that two copies of utilization certificate and final report along with seminar paper will be sent to the Council after completion of the project by the end of May 2023.

P. Veena
Signature of the Guide

P. Veena 29/5/22
Signature of the HOD

Dr. P.VEENA, M.E., Ph.D.,
Professor & Head
Department of EEE
K.S.R INSTITUTE FOR
ENGINEERING AND TECHNOLOGY,
TIRUCHENGODE- 637 215,
NAMAKKAL Dt, TAMIL NADU

U. U. P. Veena
Signature of the Principal/
PRINCIPAL
K S R INSTITUTE FOR
Head of the institution
TECHNOLOGY,
(with seal)
K. S. R. KALVI NAGAR,
TIRUCHENGODE-637 215,
NAMAKKAL Dt, TAMIL NADU.

AUTOMATIC SPEED CONTROL IN ELECTRIC VEHICLE WITH ANTI-SLEEP ALERT SYSTEM

Submitted to

TAMIL NADU STATE COUNCIL FOR SCIENCE AND TECHNOLOGY

DOTE CAMPUS, CHENNAI-600025



STUDENT PROJECT PROPOSAL



Submitted By

ARUN KUMAR P

(Reg.No: 731619105002)

KARTHIKEYAN S P

(Reg.No: 731619105007)

MANISHA M

(Reg.No: 731619105011)

NANDHINI M

(Reg.No: 731619105015)

BACHELOR OF ENGINEERING

in

ELECTRICAL AND ELECTRONICS ENGINEERING

K S R INSTITUTE FOR ENGINEERING AND TECHNOLOGY

TIRUCHENGODE-637 215



STUDENT PROJECT PROPOSAL

1. Name of the Student (s)

| S. No. | Name of the student | E-Mail ID | Phone No. |
|--------|---------------------|------------------------------|------------|
| 1. | Arun Kumar P | parunkumar293@gmail.com | 9789826996 |
| 2 | Karthikeyan S P | karthikkarthi3008@gmail.com | 9894810950 |
| 3 | Manisha M | manisham13072002@gmail.com | 7339025354 |
| 4 | Nandhini M | nandinainandhu0812@gmail.com | 8807485276 |

2. Name of the Guide : Mr. C. SIVAKUMAR
Department / Designation : Electrical and Electronics Engineering /
Assistant professor

Institutional Address : K S R Institute for Engineering and Technology,
K.S.R. kalvi nagar, Tiruchengode,
Namakkal (Dt) - 637215, Tamil Nadu.

Mobile No. : 9942688763
Guide e-mail id : siva7606@gmail.com

3. Project Title : AUTOMATIC SPEED CONTROL IN ELECTRIC
VEHICLE WITH ANTI-SLEEP ALERT SYSTEM

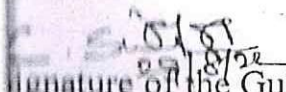
4. Project Sector : ELECTRICAL

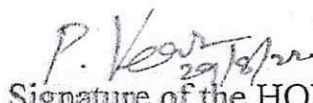
5. Project Detail : 1.Introduction 4.Work Plan
2.Objectives 5.Budget
3.Methodology 6.Any Other Details

6. Has a similar project been carried out in your college / elsewhere? If so
furnish details of the previous project and highlight the improvements
suggested in the present one : NO

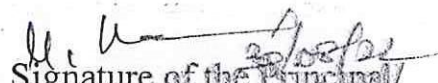
CERTIFICATE

This is to certify that **Mr. ARUNKUMAR P** is a bonafide final year student of B.E. Engineering professional courses of our college and it is also certified that two copies of utilization certificate and final report along with seminar paper will be sent to the Council after completion of the project by the end of May 2023.


Signature of the Guide


Signature of the HOD

HEAD OF THE DEPARTMENT,
DEPARTMENT OF EEE.,
K S R INSTITUTE FOR
ENGINEERING AND TECHNOLOGY,
TIRUCHENGODE-637 215

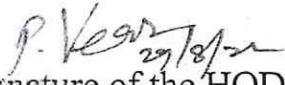

Signature of the Principal

Head of the institution
PRINCIPAL
(with seal)
K S R INSTITUTE FOR
ENGINEERING AND TECHNOLOGY,
K S R KALVI NAGAR,
TIRUCHENGODE-637 215,
NAMAKKAL DI, TAMIL NADU

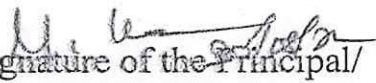
CERTIFICATE

This is to certify that Mr. KARTHIKEYAN S P is a bonafide final year student of U.C. Engineering professional courses of our college and it is also certified that two copies of utilization certificate and final report along with seminar paper will be sent to the Council after completion of the project by the end of May 2023.


Signature of the Guide


Signature of the HOD


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DEPARTMENT OF EEE.,
K S R INSTITUTE FOR
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TIRUCHENGODE-637 215.

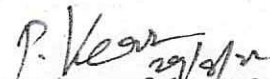

Signature of the Principal/
Head of the institution

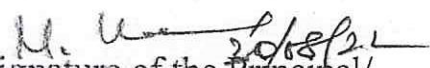
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K S R KALVINAGAR,
TIRUCHENGODE-637 215,
NAMAKKAL DI. TAMIL NADU.

CERTIFICATE

This is to certify that Ms. MANISHA M is a bonafide final year student of B.E. Engineering professional courses of our college and it is also certified that two copies of utilization certificate and final report along with seminar paper will be sent to the Council after completion of the project by the end of May 2023.


Signature of the Guide


Signature of the HOD
HEAD OF THE DEPARTMENT,
DEPARTMENT OF EEE.,
K S R INSTITUTE FOR
ENGINEERING AND TECHNOLOGY,
TIRUCHENGODE-637 215.


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Head of the institution
(with seal)
K S R INSTITUTE FOR
ENGINEERING AND TECHNOLOGY,
K S R KALVINAGAR,
TIRUCHENGODE-637 215,
NAMAKKAL Dt. TAMIL NADU.

CERTIFICATE

This is to certify that Ms. NANDHINI M is a bonafide final year student of
A.C. Engineering professional courses of our college and it is also certified that
copies of utilization certificate and final report along with seminar paper
will be sent to the Council after completion of the project by the end of May
2023.

Signature of the Guide

P. Keerthi
Signature of the HOD
HEAD OF THE DEPARTMENT,
DEPARTMENT OF EEE.,
K S R INSTITUTE FOR
ENGINEERING AND TECHNOLOGY,
TIRUCHENGODE-637 215.

M. U...
Signature of the Principal/
Head of the institution
(with seal)
K S R INSTITUTE FOR
ENGINEERING AND TECHNOLOGY,
K S R, KALVINAGAR,
TIRUCHENGODE-637 215,
NAMAKAL DISTRICT, TAMIL NADU.

IoT-BASED SMART WATER BOTTLE

Submitted to

TAMIL NADU STATE COUNCIL FOR SCIENCE AND TECHNOLOGY

DOTE CAMPUS, CHENNAI-600025



STUDENT PROJECT PROPOSAL



Submitted By

DURGA S (Reg.No: 731619105005)

JEEVANANTHAM SINGARAVEL (Reg.No: 731619105006)

MUTHUKUMAR V (Reg.No: 731619105013)

VAISHNAVI P (Reg.No: 731619105028)

BACHELOR OF ENGINEERING

in

ELECTRICAL AND ELECTRONICS ENGINEERING

K'S R INSTITUTE FOR ENGINEERING AND TECHNOLOGY

TIRUCHENGODE-637 215



STUDENT PROJECT PROPOSAL

1. Name of the Student (s)

| S.NO | Name of the Student | E-Mail ID | Phone No |
|------|-------------------------|------------------------------|------------|
| 1 | DURGA S | eeedurga2023@gmail.com | 9360693730 |
| 2 | JEEVANANTHAM SINGARAVEL | jeevananthams668@gmail.com | 6383601125 |
| 3 | MUTHUKUMAR V | muthukumar220801@gmail.com | 9790356825 |
| 4 | VAISHNAVI P | Vaishnavichandra46@gmail.com | 6385513635 |

One valid e-mail id : tamarvind1103@ksriet.ac.in

2. Name of the Guide : Mr. T. ARVIND

Department / Designation : Electrical and Electronics Engineering /
Assistant Professor

Institutional Address : K S R Institute for Engineering and Technology,
KSR kalvinagar, Tiruchengode,
Namakkal (Dt)- 6372 15
Tamil Nadu.

Mobile No. : 7502066410

3. Project Title : IoT Based Smart Water Bottle

4. Project Sector : Electrical Engineering

5. Project Detail : 1. Introduction 4. Work Plan
2.Objectives 5. Budget
3.Methodology 6. Any Other Details

6. Has a similar project been carried out in your college / elsewhere? If so, furnish details of the previous project and highlight the improvements suggested in the present one! NO

CERTIFICATE

This is to certify that Ms. DURGA S is a bonafide final year student of U.G. Engineering professional courses of our college and it is also certified that two copies of utilization certificate and final report along with seminar paper will be sent to the Council after completion of the project by the end of May 2023.

T.A. 29/5/22
Signature of the Guide

P. Veer 29/5/22
Signature of the HOD
HEAD OF THE DEPARTMENT,
DEPARTMENT OF EEE.,
K S R INSTITUTE FOR
ENGINEERING AND TECHNOLOGY,
TIRUCHENGODE-637 215.

M. V. 29/5/22
Signature of the Principal/
Head of the institution
PRINCIPAL,
K S R INSTITUTE FOR
ENGINEERING AND TECHNOLOGY,
K S R KALVI NAGAR,
TIRUCHENGODE-637 215,
NAMAKKAL DI, TAMILNADU.

CERTIFICATE

This is to certify that Mr. JEEVANANTHAM SINGARAVEL is a bonafide final-year student of U.G. Engineering professional courses of our college and it is also certified that two copies of utilization certificate and final report along with seminar paper will be sent to the Council after completion of the project by the end of May 2023.

T.A. 25/5/23
Signature of the Guide

P. Veer
Signature of the HOD

M. V. Srinivasan
Signature of the Principal/
Head of the institution

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DEPARTMENT OF EEE.,
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ENGINEERING AND TECHNOLOGY,
K S R KALVI NAGAR,
TIRUCHENGODE-637 215,
NAMAKKAL Dt. TAMIL NADU.

CERTIFICATE

This is to certify that Mr. MUTHUKUMAR V is a bonafide final year student of UG Engineering professional courses of our college and it is also certified that two copies of utilization certificate and final report along with seminar paper will be sent to the Council after completion of the project by the end of May 2023.

T. A. [Signature]
Signature of the Guide

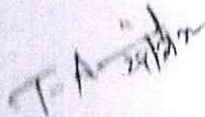
P. [Signature]
Signature of the HOD

M. [Signature]
Signature of the Principal/
Head of the institution

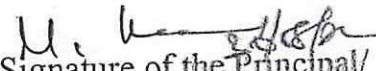
HEAD OF THE DEPARTMENT,
DEPARTMENT OF EEE.,
K S R INSTITUTE FOR
ENGINEERING AND TECHNOLOGY,
TIRUCHENGODE-637 215.
K S R INSTITUTE FOR
ENGINEERING AND TECHNOLOGY,
K S R KALVI NAGAR,
TIRUCHENGODE-637 215,
NAMAKKAL DL, TAMIL NADU.

CERTIFICATE

This is to certify that Ms.VAISHNAVI P is a bonafide final year student of U.C. Engineering professional courses of our college and it is also certified that two copies of utilization certificate and final report along with seminar paper will be sent to the Council after completion of the project by the end of May 2023.


Signature of the Guide


Signature of the HOD
HEAD OF THE DEPARTMENT,
DEPARTMENT OF EEE.,
K S R INSTITUTE FOR
ENGINEERING AND TECHNOLOGY,
TIRUCHENGODE-637 215.


Signature of the Principal/
Head of the institution
PRINCIPAL,
K S R INSTITUTE FOR
ENGINEERING AND TECHNOLOGY,
K S R KALVI NAGAR,
TIRUCHENGODE-637 215,
NAMAKKAL DL, TAMIL NADU.

K S R INSTITUTE FOR ENGINEERING AND TECHNOLOGY

RESEARCH AND DEVELOPMENT CELL

PATENT DETAILS OF ALL DEPARTMENTS

ACADMIC YEAR 2022-23

| S.No | Patent Title | Author | Application Number | Status of the Patent |
|------|---|---|--|-----------------------------|
| 1. | Artificial Intelligence and Internet of Things Technologies for Smart Agriculture | Dr.M.Vimaladevi | 202241047488 A Patent Filed Date: 20.08.2022 | Published 16/09/2022 |
| 2. | Emission-Free Embedded Based Vehicle with Solar Charging | Ms.S.Nagapavithra | 09-12-2022 202241069537 A | Published |
| 3. | A Smart System and Method for Monitoring and Controlling Furnaces | Dr.C.Santha Kumar Mr.C.Sivakumar Mr.T.Arvind Hemalatha S SarathiVasanJ Vijay I Prasanth S | 14-10-2022 202241052106 A | Published |
| 4. | A Smart System for Effective Detection of Egg Cracks | Dr.P.Veena Dr.R.Jeyabharath Mr.A.Ravi Ms.S.Nagapavithra Baskar S Gokulraj P Monisa B Naveen N | 23-09-2022 202241052124 | Published |
| 5. | An IoT Integrated Bedding System for Infants to Ease Handling on Bedwetting | Dr.T.Srihari Mr.Y.Kalimuthu Ms.R.Sacithraa Mr.M.A.Stephenraj Gokul P MeiyarasuK Nandhakumar J Sankar S | 23-09-2022 202241052105 A | Published |
| 6. | A System and Method for Balanced Charging of Cells in Batteries | Dr. A. Murugesan K. Meenatchi S. Karthick GokulRayarR JambukeshI SavuriyappanS Tamilarasan K | 16-09-2022 202241052085 | Published |
| 7. | Wearable Health Monitoring Device | Dr.S.Jayachitra | Design No: 6309616 Patent Filed Date: 11.09.2023 | Granted UK 04.12.2023 |

| | | | | |
|-----|--|---|---|---|
| 8. | Intelligent plant health monitoring systematic method Based on machine learning for precision in smart Agriculture | Ms.P.Mohanasundhari | Application No 202341066047 Patent Filed Date: 02.10.2023 | Publish ed Date: 20.10.2 023 |
| 9. | AI based smart device for student monitoring | Mr.M.M.Arun Prasath | Design No:6292418 Patent Filed Date:26.06.2023 | Granted UK (05.07. 2023) |
| 10. | Camera Based Solar Drone for Flora Identification SystemEmploying Ensemble Machine Learning | Mr.M.M.Arun Prasath | Application No. 202331025378 A Patent Filed Date: 04.04.2023 | The Patent Office Journal No. 15/2023 Dated 14/04/2 023 |
| 11. | AI based smart device for student monitoring | Mr.M.M.Arun Prasath | Design No:6292418 Patent Filed Date:26.06.2023 | Granted UK (05.07. 2023) |
| 12. | Intelligent irrigation control system in agriculture area using IOT and Sensor. | Dr.S.Premalatha | 04.03.2023 Patent number 202311014562 A | Publish ed Date: 17/03/2 023 |
| 13. | Plant Health Monitoring System (Design Patent with Grant) | Mr.P.Govindaraju Mr.M.M.Arun Prasath | Patent Filed Date: 08.12.2022 Design No: 375236-001 | Publish ed Date: 07.02.2 023 |
| 14. | Wearable Electronic Monitoring Device for Baby Health | Ms. B. Latha Ms. P. Mohana Sunthari Mrs. V. Sindhuja | Patent Filed Date 26/11/2022 Patent number 202211068063 A | Publish ed Date: 02/12/2 022 |
| 15. | The detection of varied EEG Pattern Signal for Chronic Migraine Patients Using Machine Learning Approach | Mrs .M.Dharani | Patent Filed Date: 15/11/2022 Patent number 202241065256 A | Publish ed Date: 25/11/2 022 |
| 16. | Intelligent irrigation control system in agriculture area using IOT and Sensor. | Dr.S.Premalatha | 04.03.2023 Patent number 202311014562 A | Publish ed Date: 17/03/2 023 |
| 17. | Prediction of malicious communication in vehicular adhoc network using Artificial intelligence technique | Dr. S. Jayachitra Ms. M. Jeyabharathi | Patent Filed Date: 16/11/2022 Patent number 202231065594 A | Publish ed Date: 18/11/2 022 |

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| 18. | A Smart Hybrid Charging Cover and System for Mobile Communication Devices | Mr.M.M.Arun Prasath | Patent number: 202241063465 Patent Filed Date: 07.11.2022 | Publish ed Date: 18.11.2022 |
| 19. | Wearable electronic monitoring of body parameters | Mr.M.M.Arun Prasath | Patent Filed Date: 14.10.2022 Patent number: 202221058890 | Publish ed Date: 21.10.2022 |
| 20. | The Novel routing Protocol for efficient network topology in smart grid Infrastructure | Mr.M. Udhayakumar Mr.M.M.Arun Prasath Mr.B.Vinothkumar | Patent number: 202231059317 Patent Filed Date: 17.10.2022 | Publish ed Date: 21/10/2022 |
| 21. | A Smart System and Method to Monitor and Control Peak Hour Traffic | Mohanasunthari P., B. Latha, V.Sindhuja, PrasanthS., Hari Krishnan D., JanarthananS., Nithya M., | Patent Filed Date: 13/09/2022 Patent number 202241052121 A | Publish ed Date: 14/10/2022 |
| 22. | A System of Wireless Monitoring and Communication in Weather Stations | P. Govindaraju, Dr. S. Premalatha, M.Dharani, DhivinRithikJ, JoyPrincyP, Ranjith G, | Patent Filed Date: 13/09/2022 Patent number 202241052126 A | Publish ed Date: 14/10/2022 |
| 23. | An Artificially Intelligence System For Monitoring and Preventing Dryness in Plants | Mr.M.V.Mahesh Mr.T.Marthandan Mr.M.M.Arun Prasath Mr.M. Udhayakumar S.Thulasiraman A.Suriya Dhaanu.S | Patent Filed Date: 13/09/2022 Patent number 202241052122 A | Publish ed Date: 23/09/2022 |
| 24. | System for Monitoring the Environment and Controlling Processes in an Autonomous Vehicle | Dr. M. Venkatesan Mr.R.Vasanthakumar Mr.S.Balamurugan Mr.P.Chakravarthi Mr.S.Kavin Mr.R.Krishnakumar Mr.S.Prasanth Mr.G.Samrat | Application No.202241052075 A 16/09/2022 | Published 13/09/2022 |
| 25. | A System for Anticipation and Prevention of Collisions in Heavy Motor Vehicles | Dr.P.Murugesan Mr.P.Manikandan Mr.J.Mathan Mr.G.Venkatesh Mr.S.Jayaprakash Mr.M.Praveen Mr.S.Rajasekar Mr.V.Satheeskumar | Application No.202241052076 A 16/09/2022 | Published 13/09/2022 |

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| 26. | A System and Method for Added Security in Unlocking an Automobile Ignition System | Dr.P.Gopinath Dr.M.Sivakumar Mr.K.Gopalakrishan Mr.S.Rahul Mr.R.Arivazhanhan Mr.N.Dharaneeshwaran Mr.P.Venkatesh Mr.G.Yogesh | Application No.202241052077 A 16/09/2022 | Published 13/09/2022 |
| 27. | A Smart System and Method of Scanning to Prevent Spread of a Disease vis-a-vis COVID-19 | Dr.P.Kanakarajan Dr. M. Venkatesan Mr.M.Amarnath Mr.A.Mohanraj Mr.M.Ariharan Mr.K.A.Arun Prakash Mr.V.Kathick Raja Mr.T.Monishvaran | Application No.202241052078 A 16/09/2022 | Published 13/09/2022 |
| 28. | IOT Enabled Efficient Tyre Pressure Monitoring System for Vehicles | Dr.P.Murugesan Dr.P.Kanakarajan Mr.A.Mohanraj Mr.P.Manikandan Mr.J.Mathan Mr.M.Amarnath Mr.K.Gopalakrishan | Application No.202241072742 A 30/12/2022 | Published 16/12/2022 |
| 29. | A Portable Wind Mobile Power Generator | Dr.P.Gopinath Dr.M.Sivakumar Mr.R.Vasanthakumar Mr.P.Chakravarthi Mr.S.Balamurugan Mr.S.Rahul | Application No.202241072815 A 30/12/2022 | Published 16/12/2022 |

(12) PATENT APPLICATION PUBLICATION

(21) Application No.202241052075 A

(19) INDIA

(22) Date of filing of Application :13/09/2022

(43) Publication Date : 16/09/2022

(54) Title of the invention : System for Monitoring the Environment and Controlling Processes in an Autonomous Vehicle

(51) International classification :G05D0001020000, G05D0001000000, H04L0029080000, G01C0021260000, A01D0034000000

(86) International Application No Filing Date :PCT// :01/01/1900

(87) International Publication No : NA

(61) Patent of Addition to Application Number Filing Date :NA :NA

(62) Divisional to Application Number Filing Date :NA :NA

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(57) Abstract :

The present invention relates to the field of autonomous vehicles and more particularly it discloses a system for operating other allied processes and monitoring the environment of an autonomous vehicle in natural circumstances. The existing systems does not have any cloud computing and automatic working system of the vehicles. This invention has been developed to come up with an efficient way to monitor and control the Emission rate, Working of Wipers and Intensity of Headlight Beams by the use of Sensors, Microprocessors and Micro controllers. Some of the characteristics of the vehicle should be monitored and retrieved by the use advanced technology in the Internet of Things.

No. of Pages : 20 No. of Claims : 5

(12) PATENT APPLICATION PUBLICATION

(21) Application No.202241052076 A

(19) INDIA

(22) Date of filing of Application :13/09/2022

(43) Publication Date : 16/09/2022

(54) Title of the invention : A System for Anticipation and Prevention of Collisions in Heavy Motor Vehicles

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| <p>(51) International classification :G08G0001160000, B60R0021000000, B60R0021010000, B60Q0009000000, G08B0021060000</p> <p>(86) International Application No Filing Date :PCT// :01/01/1900</p> <p>(87) International Publication No : NA</p> <p>(61) Patent of Addition to Application Number Filing Date :NA :NA</p> <p>(62) Divisional to Application Number Filing Date :NA :NA</p> | <p>(71)Name of Applicant : 1)KSR INSTITUTE FOR ENGINEERING AND TECHNOLOGY Address of Applicant :KSR Kalvi Nagar, Tiruchengode- 637 215, Namakkal District, TamilNadu, India. Tiruchengode -----</p> <p>Name of Applicant : NA Address of Applicant : NA</p> <p>(72)Name of Inventor : 1)Dr. P. Murugesan Address of Applicant :Professor, Department of Mechanical Engineering, KSR Institute for Engineering and Technology, KSR Kalvi Nagar, Tiruchengode - 637 215, Namakkal District, Tamil Nadu, India. Tiruchengode -----</p> <p>2)P. Manikandan Address of Applicant :Assistant Professor, Department of Mechanical Engineering, KSR Institute for Engineering and Technology, KSR Kalvi Nagar, Tiruchengode - 637 215, Namakkal District, Tamil Nadu, India. Tiruchengode -----</p> <p>3)J. Mathan Address of Applicant :Assistant Professor, Department of Mechanical Engineering, KSR Institute for Engineering and Technology, KSR Kalvi Nagar, Tiruchengode - 637 215, Namakkal District, Tamil Nadu, India. Tiruchengode -----</p> <p>4)G. Venkatesh Address of Applicant :Assistant Professor, Department of Mechanical Engineering, KSR Institute for Engineering and Technology, KSR Kalvi Nagar, Tiruchengode - 637 215, Namakkal District, Tamil Nadu, India. Tiruchengode -----</p> <p>5)Jayaprakash S. Address of Applicant :Student, Department of Mechanical Engineering, KSR Institute for Engineering and Technology, KSR Kalvi Nagar, Tiruchengode - 637 215, Namakkal District, Tamil Nadu, India. Tiruchengode -----</p> <p>6)Praveen M. Address of Applicant :Student Department of Mechanical Engineering, KSR Institute for Engineering and Technology, KSR Kalvi Nagar, Tiruchengode - 637 215, Namakkal District, Tamil Nadu, India. Tiruchengode -----</p> <p>7)Rajasekar S. Address of Applicant :Student, Department of Mechanical Engineering, KSR Institute for Engineering and Technology, KSR Kalvi Nagar, Tiruchengode - 637 215, Namakkal District, Tamil Nadu, India. Tiruchengode -----</p> <p>8)Satheesh Kumar V. Address of Applicant :Student, Department of Mechanical Engineering, KSR Institute for Engineering and Technology, KSR Kalvi Nagar, Tiruchengode - 637 215, Namakkal District, Tamil Nadu, India. Tiruchengode -----</p> |
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(57) Abstract :

The present invention relates to the field of automotive safety systems and more particularly it discloses an enhanced safety system for heavy automobiles towards anticipation of an accident and prevention of collision in a critical situation. The design of the vehicle accident prevention system using eye wireless technology with the aim sending signal (information) through a wireless technology at a transmission distance of wave length 0.69 m with a frequency of 433 MHz to other vehicles when drowsiness is detected was successfully designed. The result obtained from the experiments clear indicate that vehicular accident due to drowsiness can be effectively reduce to the barest minimum by implementing the vehicle accident prevention using wireless technology.

No. of Pages : 17 No. of Claims : 5

(12) PATENT APPLICATION PUBLICATION

(21) Application No.202241052077 A

(19) INDIA

(22) Date of filing of Application :13/09/2022

(43) Publication Date : 23/09/2022

(54) Title of the invention : A System and Method for Added Security in Unlocking an Automobile Ignition System

(51) International classification :G06K0009000000, G07C0009370000, G07C0009000000, B60R0025040000, B60R0025250000

(86) International Application No Filing Date :PCT// :01/01/1900

(87) International Publication No : NA

(61) Patent of Addition to Application Number Filing Date :NA :NA

(62) Divisional to Application Number Filing Date :NA :NA

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(57) Abstract :

The present invention relates to the field of automotive security systems and more particularly it refers to a method and a system for enhanced security in unlocking the ignition system of an automotive. The system consists of two mode security system of two wheeler, one is face recognition and thumb impression based security system. Here ESP 32 cam and 307 thumb scanners used for comparing bio metrics of the person. Whenever the person operate the two wheeler our system recognize face and thumb impression. If the recognized data compared with our library. After the verification vehicle ignition on if the data matched with authorized person. In case if not matched. Its gives alert to owner of the two wheeler.

No. of Pages : 18 No. of Claims : 5

(12) PATENT APPLICATION PUBLICATION

(21) Application No.202241052078 A

(19) INDIA

(22) Date of filing of Application :13/09/2022

(43) Publication Date : 16/09/2022

(54) Title of the invention : A Smart System and Method of Scanning to Prevent Spread of a Disease vis-a-vis COVID-19

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| <p>(51) International classification :A62B0023020000, G16H0050800000, A41D0013110000, C12Q0001681600, A61M0016160000</p> <p>(86) International Application No Filing Date :PCT// :01/01/1900</p> <p>(87) International Publication No : NA</p> <p>(61) Patent of Addition to Application Number Filing Date :NA :NA</p> <p>(62) Divisional to Application Number Filing Date :NA :NA</p> | <p>(71)Name of Applicant : 1)KSR INSTITUTE FOR ENGINEERING AND TECHNOLOGY Address of Applicant :KSR Kalvi Nagar, Tiruchengode- 637 215, Namakkal District, TamilNadu, India. Tiruchengode ----- Name of Applicant : NA Address of Applicant : NA</p> <p>(72)Name of Inventor : 1)Dr. P. Kanakarajan Address of Applicant :Associate Professor, Department of Mechanical Engineering, KSR Institute for Engineering and Technology, KSR Kalvi Nagar, Tiruchengode - 637 215, Namakkal District, Tamil Nadu, India. Tiruchengode ----- 2)Dr. M. Venkatesan Address of Applicant :Principal, KSR Institute for Engineering and Technology, KSR Kalvi Nagar, Tiruchengode - 637 215, Namakkal District, Tamil Nadu, India. Tiruchengode ----- 3)M. Amarnath Address of Applicant :Assistant Professor, Department of Mechanical Engineering, KSR Institute for Engineering and Technology, KSR Kalvi Nagar, Tiruchengode - 637 215, Namakkal District, Tamil Nadu, India. Tiruchengode ----- 4)A. Mohanraj Address of Applicant :Assistant Professor, Department of Mechanical Engineering, KSR Institute for Engineering and Technology, KSR Kalvi Nagar, Tiruchengode - 637 215, Namakkal District, Tamil Nadu, India. Tiruchengode ----- 5)Ariharan M. Address of Applicant :Student, Department of Mechanical Engineering, KSR Institute for Engineering and Technology, KSR Kalvi Nagar, Tiruchengode - 637 215, Namakkal District, Tamil Nadu, India. Tiruchengode ----- 6)Arun Prakash K. A. Address of Applicant :Student Department of Mechanical Engineering, KSR Institute for Engineering and Technology, KSR Kalvi Nagar, Tiruchengode - 637 215, Namakkal District, Tamil Nadu, India. Tiruchengode ----- 7)Karthick Raja V. Address of Applicant :Student, Department of Mechanical Engineering, KSR Institute for Engineering and Technology, KSR Kalvi Nagar, Tiruchengode - 637 215, Namakkal District, Tamil Nadu, India. Tiruchengode ----- 8)Monishvaran T Address of Applicant :Student, Department of Mechanical Engineering, KSR Institute for Engineering and Technology, KSR Kalvi Nagar, Tiruchengode - 637 215, Namakkal District, Tamil Nadu, India. Tiruchengode -----</p> |
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(57) Abstract :

The present invention relates to the field of medical scanning systems and more particularly it refers to an automated and smart system and method for detection of temperature and mask wearing norms in an entry to hinder the spread of a disease. The Corona Mask provides a real-time safety measure for human beings by detecting whether a person is wearing the mask or not as wearing a mask is an essential need of the hour in this COVID-19 pandemic. This invention has been developed to come up with an efficient way for detecting and notifying officials when a person does not follow the COVID 19 safety protocols in a workplace, business establishments etc.

No. of Pages : 19 No. of Claims : 6

(12) PATENT APPLICATION PUBLICATION

(21) Application No.202241072742 A

(19) INDIA

(22) Date of filing of Application :16/12/2022

(43) Publication Date : 30/12/2022

(54) Title of the invention : IOT ENABLED EFFICIENT TYRE PRESSURE MONITORING SYSTEM FOR VEHICLES

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| <p>(51) International classification :B60C0001000000, B60C0023000000, G01M0017020000, G07C0005080000, B60S0005040000</p> <p>(86) International Application No :PCT// Filing Date :01/01/1900</p> <p>(87) International Publication No : NA</p> <p>(61) Patent of Addition to Application Number :NA Filing Date :NA</p> <p>(62) Divisional to Application Number :NA Filing Date :NA</p> | <p>(71)Name of Applicant : 1)Nagaraj Balakrishnan Address of Applicant :16/10, Kamar Street, Aarupadai Nagar, Vellalore Post.</p> <p>2)Dr. M. Venkatesan 3)Dr.P.Murugesan 4)Dr.P. Kanakarajan 5)A.Mohanraj 6)P.Manikandan 7)J.Mathan 8)M.Amarnath 9)K.Gopalakrishan 10)P.S.Prakash Kumar Name of Applicant : NA Address of Applicant : NA</p> <p>(72)Name of Inventor : 1)Dr. M. Venkatesan Address of Applicant :K S R Institute for Engineering and Technology Tiruchengode -----</p> <p>2)Dr.P.Murugesan Address of Applicant :K S R Institute for Engineering and Technology Tiruchengode -----</p> <p>3)Dr.P. Kanakarajan Address of Applicant :K S R Institute for Engineering and Technology, KSR Kalvi Nagar, Tiruchengode -----</p> <p>4)A.Mohanraj Address of Applicant :K S R Institute for Engineering and Technology Tiruchengode -----</p> <p>5)P.Manikandan Address of Applicant :K S R Institute for Engineering and Technology Tiruchengode -----</p> <p>6)J.Mathan Address of Applicant :K S R Institute for Engineering and Technology Tiruchengode -----</p> <p>7)M.Amarnath Address of Applicant :K S R Institute for Engineering and Technology Tiruchengode -----</p> <p>8)K.Gopalakrishan Address of Applicant :K S R Institute for Engineering and Technology Tiruchengode -----</p> <p>9)P.S.Prakash Kumar Address of Applicant :K S R Institute for Engineering and Technology Tiruchengode -----</p> |
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(57) Abstract :

This invention is to create a product that monitors tyre inflation in vehicles and alerts the driver to the pressure levels of all tyres. Our invention focuses on the activity of avoiding fuel waste and steering precision loss due to inflation. In the case of tyre inflation, there are three possible outcomes: under-inflation, over-inflation, and correct inflation. Under-inflation causes the tyre to lose shape and flatten, increasing friction with the road and reducing tyre life by 25%. This also generates internal heat and increases rolling resistance, making it impossible to maintain fuel consumption, resulting in 5% fuel waste. Control over the steering will eventually become uncomfortable, which may result in an accident. Tyres with over-inflation will be stiff and larger than their foot print. As the tire's contact with the road decreases, the actual shock experienced by the tyre is transmitted to the passengers and other parts of the vehicle. The concentrated steering response, on the other hand, will be maintained. Maintaining proper tyre inflation pressure aids in the optimization of tyre performance and fuel economy. These are the main motivation for the invention of cost efficient Tyre inflation monitoring system for any vehicle.

No. of Pages : 8 No. of Claims : 6

(12) PATENT APPLICATION PUBLICATION

(21) Application No.202241072815 A

(19) INDIA

(22) Date of filing of Application :16/12/2022

(43) Publication Date : 30/12/2022

(54) Title of the invention : A PORTABLE WIND MOBILE POWER GENERATOR

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| <p>(51) International classification :H02J0007000000, F03D0007020000, F03D0009250000, H02K0007180000, F03D0001060000</p> <p>(86) International Application No Filing Date :PCT// :01/01/1900</p> <p>(87) International Publication No : NA</p> <p>(61) Patent of Addition to Application Number Filing Date :NA :NA</p> <p>(62) Divisional to Application Number Filing Date :NA :NA</p> | <p>(71)Name of Applicant : 1)Nagaraj Balakrishnan Address of Applicant :16/10, Kambar Street, Aarupadai Nagar, Vellalore Post. ----- 2)Dr.P.Meenakshi Devi 3)Dr.P.Gopinath 4)Dr.M.Sivakumar 5)P.Govindaraju 6)R.Vasanthakumar 7)P.Chakravarthi 8)S.Balamurugan 9)S.Rahul Name of Applicant : NA Address of Applicant : NA (72)Name of Inventor : 1)Dr.P.Meenakshi Devi Address of Applicant :K S R Institute for Engineering and Technology Tiruchengode ----- 2)Dr.P.Gopinath Address of Applicant :K S R Institute for Engineering and Technology Tiruchengode ----- 3)Dr.M.Sivakumar Address of Applicant :K S R Institute for Engineering and Technology Tiruchengode ----- 4)P.Govindaraju Address of Applicant :K S R Institute for Engineering and Technology Tiruchengode ----- 5)R.Vasanthakumar Address of Applicant :K S R Institute for Engineering and Technology Tiruchengode ----- 6)P.Chakravarthi Address of Applicant :K S R Institute for Engineering and Technology Tiruchengode ----- 7)S.Balamurugan Address of Applicant :K S R Institute for Engineering and Technology Tiruchengode ----- 8)S.Rahul Address of Applicant :K S R Institute for Engineering and Technology Tiruchengode -----</p> |
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(57) Abstract :

This invention aims to create a highly effective portable windmill that will generate renewable energy for portable devices like tablets, laptops, and smartphones. Our invention focuses on a design that generates the most efficiency and power possible, in order to power the generator that is attached to it. In this, we created the Convergent-Divergent Nozzle, a new six-bladed turbine rotor fixed axially vertically inside a wind focuser. The narrow wind focused region where the turbine is located causes a rapid increase in the driving torque of the turbine, which is proportional to the speed of the wind entering the inlet. So that you can use this device to charge your portable electronics while you're on the go. The novel system's simulation results are mentioned.

No. of Pages : 8 No. of Claims : 8

(54) Title of the invention : Emission-Free Embedded Based Vehicle with Solar Charging

(51) International Classification : B62M0006450000, B62M0006900000, B62M0006550000, B60L0050200000, B60K0016000000

(86) International Application No : PCT/ Filing Date : 01/01/1900

(87) International Publication No : NA

(61) Patent of Addition to Application Number : NA Filing Date : NA

(62) Divisional to Application Number : NA Filing Date : NA

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(57) Abstract :

The major goal of this idea is to describe how to create an inexpensive, straightforward electrical bicycle model with an intelligent control system. A bicycle is a low-cost substitute for a car. The major power source for the bicycle is a mechanically coupled dc motor, which is electrically connected to a dc rechargeable battery with effective transmission from the source to the motor. This essay comprises on an electric bike design that uses electricity as its main energy source and, if practical, solar energy by mounting solar panels. As a result, the suggested method is the most effective and economical one for meeting users' needs today. In order to comprehend the many various classifications that this type of vehicle can have and what were our legal limitations, a survey was done to grasp the legislation that pertains to it. Research into the market revealed that sales of e-bikes had increased dramatically in recent years. The focus of this study is the rising demand for electric motorcycles. Our primary area of interest is the automotive sector, where we are transforming old bicycles into electric bicycles. This study's main objective is to accurately depict the range of energy sources available to humanity by connecting them all. Humanity needs travel in order to advance in the modern, civilized world. His journey should be as swift and painless as possible in order for him to achieve goal. This study focuses on the electric bike, which has a battery that powers it and provides voltage to the motor. The design and building of an electric bike that uses electricity as its main source of power is the subject of this study. There is a setting for a rechargeable battery in the main system. The bike's electrical power can provide higher performance, fuel efficiency, and pollution reduction when compared to a regular car.

No. of Pages : 8 No. of Claims : 3

(12) PATENT APPLICATION PUBLICATION

(21) Application No.202241052085 A

(19) INDIA

(22) Date of filing of Application :13/09/2022

(43) Publication Date : 16/09/2022

(54) Title of the invention : A System and Method for Balanced Charging of Cells in Batteries

(51) International classification :G01R0031392000, H02J0007000000, H01M0010440000, G01R0031367000, H01M0010052000
(86) International Application No :PCT//
Filing Date :01/01/1900
(87) International Publication No : NA
(61) Patent of Addition to Application Number :NA
Filing Date :NA
(62) Divisional to Application Number :NA
Filing Date :NA

(71)Name of Applicant :
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(72)Name of Inventor :
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(57) Abstract :

The present embodiment relates to batteries and more particularly it discloses a smart system and method for balanced charging of cells in batteries with special application to the electric vehicles. The novelty of this invention arises from model based control algorithm for battery fast charging. Specifically, an optimal charging control problem has been formulated for SOC and SOH reference tracking based on the MPC algorithm, which makes use of an internal battery model and explicitly handles operating constraints. Significant improvement was observed in terms of charging time and state of health preservation relative to the industry standard charging algorithms.

No. of Pages : 25 No. of Claims : 5

(12) PATENT APPLICATION PUBLICATION

(21) Application No.202241052124 A

(19) INDIA

(22) Date of filing of Application :13/09/2022

(43) Publication Date : 23/09/2022

(54) Title of the invention : A Smart System for Effective Detection of Egg Cracks

(51) International classification :G06T0007000000, H04N0005232000, A01K0045000000, C08L0023040000, G06Q0050020000
(86) International Application No :PCT//
Filing Date :01/01/1900
(87) International Publication No : NA
(61) Patent of Addition to Application Number :NA
Filing Date :NA
(62) Divisional to Application Number :NA
Filing Date :NA

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(57) Abstract :

The present embodiment relates to a detection and testing techniques and more particularly it discloses a smart and an efficient system for the detection of cracked eggs especially applicable in a poultry farm. The traditional way of crack detection is being replaced with smart and intelligent techniques using IoT and image processing. This in turn provides improved productivity and profit for the poultry farms. As a result, the technology evolves with 80% accuracy in detection high-speed detection, and fast computational time. This improves the productivity of poultry farms with reduced losses at both the customers' end and producer end.

No. of Pages : 30 No. of Claims : 6

(12) PATENT APPLICATION PUBLICATION

(21) Application No.202241052105 A

(19) INDIA

(22) Date of filing of Application :13/09/2022

(43) Publication Date : 23/09/2022

(54) Title of the invention : An IoT Integrated Bedding System for Infants to Ease Handling on Bedwetting

(51) International classification :A61F0013420000, A61F0005480000, A61B0005200000, H02J0003280000, H01L0021670000
(86) International Application No :PCT//
Filing Date :01/01/1900
(87) International Publication No : NA
(61) Patent of Addition to Application Number :NA
Filing Date :NA
(62) Divisional to Application Number :NA
Filing Date :NA

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Name of Applicant : NA

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Address of Applicant :Student, Department of Electrical and Electronics Engineering, KSR Institute for Engineering and Technology, KSR Kalvi Nagar, Tiruchengode - 637 215, Namakkal District, Tamil Nadu, India. Tiruchengode -----

(57) Abstract :

The present embodiment relates to infant handling gadgets and more particularly it refers to a system integrated to the bedding of infants which is further integrated with IoT on quick and automated dry sheet changing ability during bedwetting times. This invention provides a basic system of bed wetting detection which can be easily implemented and used effectively. The bed wetting is automated using various sensors, processors and IOT Platform. Wet sensor is used to identify the wet condition and intimated to the parents or care taker. Wet sensor is used to detect the presence of urination of video recording, image capturing especially during night time.

No. of Pages : 28 No. of Claims : 4

(54) Title of the invention : WEARABLE ELECTRONIC MONITORING DEVICE FOR BABY HEALTH

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| <p>(51) International classification :G06Q0010100000, H01M0004040000, H02J0007000000, H04N0021214000, H04W0084120000</p> <p>(86) International Application No :NA Filing Date :NA</p> <p>(87) International Publication No : NA Filing Date :NA</p> <p>(61) Patent of Addition to Application Number :NA Filing Date :NA</p> <p>(62) Divisional to Application Number :NA Filing Date :NA</p> | <p>(71)Name of Applicant :</p> <p>1)Mrs. Jasmi Johnson Address of Applicant :Professor, Obg Nursing, Rama College of Nursing, Rama university, Kanpur - 209217, Uttarpradesh, India Kanpur -----</p> <p>2)Mr. SatishKanapala</p> <p>3)Dr. V. Kannan</p> <p>4)Mr. J Logeshwaran</p> <p>5)Ms. B. Latha</p> <p>6)Ms. P. Mohana Sunthari</p> <p>7)Mrs. V. Sindhuja</p> <p>8)Dr. Jyoti Prasad Patra</p> <p>9)Mr. Raj Arvindkumar Hakani</p> <p>10)Prof. Dr. Yegnanarayanan Venkataraman</p> <p>Name of Applicant : NA Address of Applicant : NA</p> <p>(72)Name of Inventor :</p> <p>1)Mrs. Jasmi Johnson Address of Applicant :Professor, Obg Nursing, Rama College of Nursing, Rama university, Kanpur - 209217, Uttar Pradesh, India Kanpur -----</p> <p>2)Mr. SatishKanapala Address of Applicant :Assistant Professor, Electronics and Communication Engineering (ECE), Vignan's Foundation for Science, Technology and Research, Guntur - 522213, Andhra Pradesh, India Guntur -----</p> <p>3)Dr. V. Kannan Address of Applicant :Managing director, CLDC Research and Development, No.997, Mettupalayam Road, Near X-Cut Signal, R.S. Puram, Coimbatore - 641002, Tamil Nadu, India Coimbatore -----</p> <p>4)Mr. J Logeshwaran Address of Applicant :Research Scholar, Department of Electronics and Communication Engineering, Sri Eshwar College of Engineering, Coimbatore - 641202, Tamil Nadu, India Coimbatore -----</p> <p>5)Ms. B. Latha Address of Applicant :Assistant Professor, Electronics and Communication Engineering (ECE), K S R Institute For Engineering And Technology, Tiruchengode - 637215, Tamil Nadu, India Tiruchengode -----</p> <p>6)Ms. P. Mohana Sunthari Address of Applicant :Assistant Professor, Electronics and Communication Engineering (ECE), K S R Institute For Engineering And Technology, Tiruchengode - 637215, Tamil Nadu, India Tiruchengode -----</p> <p>7)Mrs. V. Sindhuja Address of Applicant :Assistant Professor, Electronics and Communication Engineering (ECE), K S R Institute For Engineering And Technology, Tiruchengode - 637215, Tamil Nadu, India Tiruchengode -----</p> <p>8)Dr. Jyoti Prasad Patra Address of Applicant :Faculty Electrical, Odisha University of Technology And Research (Outr), Bhubaneswar - 751029, Odisha, India Bhubaneswar -----</p> <p>9)Mr. Raj Arvindkumar Hakani Address of Applicant :Assistant Professor, Electronics and Communication, Gujarat Technological University, Ahmedabad - 382424, Gujarat, India Ahmedabad -----</p> <p>10)Prof. Dr. Yegnanarayanan Venkataraman Address of Applicant :Professor, Mathematics, Kalasalingam Academy of Education And Research, Deemed To Be University, Krishnankoil - 626126, Tamil Nadu, India Krishnankoil - -----</p> |
|---|--|

(57) Abstract :

Generally, constant powered power sources are mandatory in these devices to ensure the desired performance. Besides, due to the portability of PEDs, the development of energy storage sources with high safety is much needed. With the growing demands of long operating time of PEDs, the efficiency of energy storage systems needs to be improved. Accordingly, exploring efficient, long-life, safe and large-capacity energy storage devices is strongly demanded to address the current challenges of PEDs. With the development and innovation of electronic technology, PEDs have grown rapidly over the past decades. The primary motivation behind this activity is that PEDs are widely used in our daily life, from personal devices used in space to high-tech devices due to their ability to interact with humans and have brought great convenience and era, becoming an indispensable part of almost every person. Electrochemical energy storage systems, especially rechargeable batteries, have been widely used as power sources of PEDs for decades and have promoted the growing development of PEDs. To meet the continuously high demands of PEDs, significant improvements have been achieved in the electrochemical performances of rechargeable batteries.

No. of Pages : 9 No. of Claims : 8

(12) PATENT APPLICATION PUBLICATION

(21) Application No.202241065256 A

(19) INDIA

(22) Date of filing of Application :15/11/2022

(43) Publication Date : 25/11/2022

(54) Title of the invention : The detection of Varied EEG pattern Signal For Chronic Migraine Patients Using Machine Learning Approach

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| <p>(51) International classification :A61P0025060000, A61M0021000000, G08B0003100000, A61P0001080000, G08B0007060000</p> <p>(86) International Application No :PCT// Filing Date :01/01/1900</p> <p>(87) International Publication No : NA</p> <p>(61) Patent of Addition to Application Number :NA Filing Date :NA</p> <p>(62) Divisional to Application Number :NA Filing Date :NA</p> | <p>(71)Name of Applicant : 1)DR.T.NALLUSAMY Address of Applicant :DIRECTOR, CAREER DEVELOPMENT CENTER, J.J.GROUP OF INSTITUTIONS, TRICHY - DT, TAMILNADU-620009 -----</p> <p>2)Dr. V.Kannan 3)Felipe De Castro Dantas Sales 4)Mr.J Logeshwaran 5)Mr. Rajeev Ratna Vallabhuni 6)Dr. SAYYED MATEEN 7)Ms.MDHARANI 8)Mr. CH. Mohan Sai Kumar 9)Sanjesh Kumar 10)Mansi Singh 11)DR. SANDEEP KUMAR 12)PROF.DR.YEGNANARAYANAN VENKATARAMAN Name of Applicant : NA Address of Applicant : NA</p> <p>(72)Name of Inventor : 1)DR.T.NALLUSAMY Address of Applicant :DIRECTOR, CAREER DEVELOPMENT CENTER, J.J.GROUP OF INSTITUTIONS, TRICHY - DT, TAMILNADU-620009 -----</p> <p>2)Dr. V.Kannan Address of Applicant :Managing director, CLDC Research and Development No.997, Mettupalayam Road, Near X-Cut Signal,R.S.Puram, Coimbatore-641002 -----</p> <p>3)Felipe De Castro Dantas Sales Address of Applicant :Health care management, MUST University, Florida -----</p> <p>4)Mr.J Logeshwaran Address of Applicant :Research Scholar, Department of Electronics and Communication Engineering, Sri Eshwar College of Engineering, Coimbatore -----</p> <p>5)Mr. Rajeev Ratna Vallabhuni Address of Applicant :Application Developer, Bayview Asset Management, LLC, FLORIDA, USA -----</p> <p>6)Dr. SAYYED MATEEN Address of Applicant :Associate Professor, Pharmacology, Oriental College of Pharmacy, Mumbai, Maharashtra -----</p> <p>7)Ms.MDHARANI Address of Applicant :ASSISTANT PROFESSOR ,ECE, K S R INSTITUTE FOR ENGINEERING AND TECHNOLOGY , TIRUCHENGODE , TAMILNADU-637215 -----</p> <p>8)Mr. CH. Mohan Sai Kumar Address of Applicant :Assistant Professor, Electronics and Communication Engineering (ECE), Vel Tech Rangarajan Dr. Sagunthala R&D Institute of Science and Technology, Chennai, Avadi-600 062 -----</p> <p>9)Sanjesh Kumar Address of Applicant :PhD Research Scholar, Institute of Pharmaceutical Sciences, GLA University Mathura, Bareilly- 243001 -----</p> <p>10)Mansi Singh Address of Applicant :PhD Research Scholar, Institute of Pharmaceutical Sciences, GLA University Mathura, Bareilly- 243001 -----</p> <p>11)DR. SANDEEP KUMAR Address of Applicant :ASSOCIATE PROFESSOR, DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING., MAHARAJA SURAJMAL INSTITUTE OF TECHNOLOGY,NEW DELHI-110058, -----</p> <p>12)PROF.DR.YEGNANARAYANAN VENKATARAMAN Address of Applicant :PROFESSOR, MATHEMATICS, KALASALINGAM ACADEMY OF EDUCATION AND RESEARCH, DEEMED TO BE UNIVERSITY, KRISHNANKOIL-626126, -----</p> |
|--|--|

(57) Abstract :
Migraine that melts the body and mind - Micron headache (Migraine) is a neurological disease with symptoms such as changes in body sensations, intense headache, nausea. A significant migraine is characterized by a severe, pulsating headache that occurs on one side of the head and can last for 4 to 72 hours. It's important symptoms are nausea, vomiting, light and sound intolerance. About one-third of migraine sufferers will experience some warning signs before the onset of these migraines. The most common sensory changes are visual field changes (eg: bright lights, black spots, "Z" shapes), pins and needles in the neck, shoulder, balance, slurred speech, and inability to smell. There are warning signs. These warning signs can occur 15 minutes to 1 hour before the onset of a migraine. Such a migraine is known as classical migraine, and migraine without specific warning symptoms is called common migraine. Migraines occur due to reduced tolerance to light and sound. People who suffer from this prefer to stay in a dark, quiet state.

No. of Pages : 10 No. of Claims : 10

Proposals submitted to the Funding Agencies

ACADEMIC YEAR: 2022 – 2023

| S. No | Projects / Programmes Title | Funding Agency | Amount Applied |
|-------|---|--------------------------------|----------------|
| 1. | Science, Technology and Innovation Hub for creating Sustainable Livelihood Opportunities of Scheduled Castes in Tiruchengode Block, Namakkal District, Tamil Nadu | DST | 1,56,67,765 |
| 2 | Developing Novel Application for 3D Printing is a Key Concern for Researchers | CSIR | 77,500 |
| 3 | Five Days Seminar on Recent Advancements And Future Trends Of Electric Vehicle Technologies | SERB | 1,10,000 |
| 4 | Experimental Investigation on Joining Various Alloy Materials using Friction Stir Welding | SERB | 28,45,000 |
| 5 | Hybrid Energy Storage System | DST | 60,40,000 |
| 6 | Demystifying Industry 4.0: Opportunities & Challenges | SERB | 5,00,000 |
| 7 | Hybrid Composite Materials for Automotive Applications | CSIR | 1,50,000 |
| 8 | Design and Analysis of Thermal Management System for Lithium-ion Battery Modules in Electric Vehicles | SERB | 46,60,000 |
| 9 | Seminar on "Machine Learning Techniques for cancer diagnosis: challenges and perspectives" | SERB | Rs.2,05,200 |
| 10 | Application for "5G use case lab in higher education Institutions" | TCIL | NA |
| 11 | Design of Wearable and Implantable Antenna for Military Application using HFSS/CST Studio and Matlab | DRDO | Rs.2,25,000 |
| 12 | A Smart and Safe Drainage System Design Using MANET-IOT and Artificial Intelligence | SERB-Power Fellowship | Rs.30,00,000 |
| 13 | 24x7 Smart Ring-Wearable system to against violence on school children | DST-Inspire faculty fellowship | Rs.1,25,000 |



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EXPERIMENTAL INVESTIGATION ON JOINING VARIOUS ALLOY MATERIALS USING FRICTION STIR WELDING

Reference No. : 132022005426

Saved By : Dr. GOPINATHP

[SERB Qualified Unique Identification Document: SQUID-1976-GP-5347]

Saved Date : 17-Sep-2022

PROPOSAL DETAILS

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Technical Details :

Scheme : StateUniversityResearchExcellence(SERBSURE)
ResearchArea: Mechanical&ManufacturingEngineering&Robotics(EngineeringSciences)
Duration : 36 Months **ContactNo:** +919500998458
DateofBirth: 13-Apr-1976
Nationality: INDIAN **TotalCost(INR):** 28,45,000

ProjectSummary:

Friction stir welding (FSW) is revolutionary welding technology enabled solid-state joining. This technique is widely considered as one of the most significant recent advancements in the field of joining. FSW is a patented new welding process that has had led to many worldwide applications, predominantly in the fabrication of aluminium components and panels. Friction stir welding (FSW) applied to high strength aluminium alloys used in aircraft industry and displays their advantages compared with theriveting techniqueregarding structuralintegrity, weight and material savings. FSW has an advantage that the joining is conducted at the temperature below the melting point of the materials to be joined. Therefore, improved mechanical performance of joints is expected compared to that of fusion joining processes such as laser beam welding (LBW). Furthermore, better mechanical properties can be obtained when heat input during joining is reduced by employing stationary shoulder FSW and/orexternal cooling.Aluminiumandcopperareemployedinvariousindustrial applications due to their high plasticity, thermal conductivity, and electrical conductivity characteristics. The current collectors of Li-ion batteries are generally composed of dissimilar materials, such as aluminium and copper that have a thickness of 500 µm. In battery pack welding, existing techniques such as ultrasonic and laser are ineffective since the materialsare micro-thickness, have the same crystal structure as the face-centred cubic, and are highly reflective materials. In the present study, friction stir welding is used to join micro sheets of AA1060 and pure copper in a lap configuration. Variations in FSW process parameters affect friction heat generation. The combination of frictional heat and metal diffusion leads to the formationofintermetalliccompoundsandchangeinintermetalliccompound(IMC)thickness. Considering the FSW in battery pack applications, the joining dissimilar Al-Cu micro sheets have several challenges like controlling the IMC and void formation. Further, this study investigates the optimum process parameters for joining micro sheets of dissimilar materials basedontensilestrength,IMCformation,andfatigueanalysis. Additionally,no comprehensive study has been undertaken on fatigue analysis for FSW of Al-Cu joints with a thickness of 500 µm. Based on the applications of electric vehicles, the study on fatigue life of Al-Cu tabs joining is crucial in determining the battery pack life from many external factors, including vibration and damping.

Objectives:

- Theinfluenceoffrictionstirweldingprocessparameterssuchasrotationalspeedand weldingspeedonthemicro-structuralandmechanicalpropertiesofthejoints werestudied.
- Themetallurgicalbondingduetotheformationofintermetalliccompoundsandthe mechanicalinterlockingwasobservedinthepresentstudy.
- Strengtheningmechanismofthenuggetzonewasdiscussedindetail.

Keywords:

Frictionstirwelding,Dissimilarjoint,Mechanicalproperty,Li-ionbatterytabs,Intermetallic compound.

ExpectedOutputandOutcomeoftheproposal:

TheAl-Cudissimilarjoints werereproducedatdifferentprocessparameterstodeterminethe optimumparameters.Thestudydetailsthefrictionalheatgenerationduetovariationin processparameters,weldnuggetinterface,IMCformation,tensilestrength,andfatiguepropertiesofthe FSWjoints.TheIMCs,Al-Cuinthenuggetzonearepredictedtoplayanessentialroleinachievinggoodmechanicalpropertiesintheweldjoint.Mechanicalfractures tendedtoextendintheIMClayer,andfurthercrackpropagatedalongwiththedetrimental IMCparticlespresentinthestirzone.Consequently,sampleswithproperdiffusionbetween thesubstratesformductileIMCs,whichexhibitgoodtensilestrengthandfatiguelifeofweld joints.Therefore,theIMCsplayacrucialroleindeterminingthemechanicalpropertiesofAl-Cujoints.Weldinghighstrengthanddissimilar metalsarechallengingandoffertremendous opportunityforthegrowthofthemanufacturingindustries,especiallyinautomobiles.Dissimilar materi also pose more problemsinjoiningdue totheir different chemical composition ofelements,mechanicalstrength,andthermalpropertieslikemelting,recrystallizationtemperature,etc .Forjoiningdissimilar materials,thesolid-stateweldingmethodismost suitable.FSWtechnologyhasgainedindustrialapplicationduetoitsabilitytojointraditional fusionweldingmethodsandprovideanoutstandingweldingqualityfordissimilar materials.

SuitabilityoftheproposedworkinmajornationalinitiativesoftheGovernment:

SwachhBharat,StartupIndia,InnovateIndia

ThemeofProposedWork:

Environment,Manufacturing

CollaborationDetailsforlast5Years:

PlannedCollaborationfortheproposedworkwithanyforeignscientist/institution?

No

| SNo. | CO-PIDetails |
|------|--|
| 1 | <p>KANAKARAJANP kanagu.dhana@ksriet.ac.in ASSOCIATEPROFESSOR(MECHANICALENGINEERING)</p> <p>KSRINSTITUTEFORENGINEERINGANDTECHNOLOGY KALVINAGARTIRUCHGODENAMAKKAL(DT)Tamilnadu,TAMILNADU,NAMAKKAL <i>College(Private)</i> D.O.B:25Apr,1967</p> |
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Other Technical Details

1. Origin of the Proposal:

Research in the field of welding between dissimilar materials has gained extensive interest among the scientists and engineers. The demand to develop machine parts that are light in weights, high strength, improved electrical properties and cost-effective is continuously increasing in various industries. Owing to their excellent thermal and electrical conductivities, the use of aluminium and copper are widely applied in various applications, primarily in electrical, automotive, and refrigeration industries. Table 1 shows some physical properties of these metals. Aluminium to copper dissimilar joints is often used in a variety of applications, including batteries tab to bus bars joining, electrical connectors, and transformer foil conductors.

Table 1 Physical properties of the Aluminium and Copper

| Physical Property | Aluminium | Copper |
|---|-----------|--------|
| Density (g/cm ³) | 2.7 | 8.94 |
| Melting point (°C) | 660 | 1083 |
| Tensile strength (N/mm ²) | 150 | 290 |
| Electrical conductivity (10 ⁶ S/m) | 34 | 58 |
| Thermal conductivity (W/mK) | 210 | 393 |
| Thermal expansion (10 ⁶ /m) | 23.5 | 17 |

A significant technology transition of the automotive industry in introducing electric drive systems for the commercial market has demanded a new lithium-ion battery technology. In the automotive industry, mainly, copper and aluminium are used to manufacture terminals and bus bars for lithium-ion batteries in electric vehicles. Many individual battery cells are assembled in a series configuration by bus bars to be used in these vehicles, forming a battery pack that acts as a high-power source to the system. Conventionally, Al-Cu joints in battery tabs and bus bars are achieved via micro-clinching or mechanical fastening.

Mechanical joining is the most often used technology of conventional Al-Cu joint welding. Mechanical joining techniques such as bolting and riveting increase the structure's weight by incorporating high-strength rivets and bolts. The drilling of holes for bolts and rivets increases stress

concentration and influences the structure's fatigue efficiency. Due to significant differences in physical and metallurgical characteristics, the dissimilar joints of aluminium and copper are prone to form large brittle intermetallic compounds (IMC) at elevated temperatures. The formation of the IMC layer between the Al-Cu interfaces adversely affects the joint's strength and electrical conductivity performance. Since the amount of the IMC layer depends on the heat generated during the joining process, the thickness of this layer is tough to control in conventional welding techniques.

Resistance spot welding (RSW) has been adopted to join 0.4 mm thickness of copper and aluminium tabs for battery connections. However, a satisfactory Al-Cu joint was difficult to obtain because of the higher thermal and electrical conductivity of copper and the presence of an oxide layer on the surface of aluminium. It was found that joint strength made by micro-TIG are greater than those produced by RSW; however, cracks and circumferential fractures at the welding zone are included when the shear load is applied, leading to material failure.

Joining aluminium and copper through a solid-state welding technique could minimise the above-mentioned adverse effects. Friction stir welding (FSW) is a solid-state joining process introduced by The Welding Institute in 1991, has shown great potential to join similar and dissimilar materials. With frictional heat produced by a non-consumable rotating tool, plastic deformation of the metal contact occurs, leading to mixing the workpiece materials and several advantages over conventional joining techniques used to produce joints. It is essential to provide a thorough understanding of this critical topic of Al-Cu welding with FSW. The current knowledge regarding the FSW process parameters, the interaction between Al-Cu, different FSW process techniques, and their consequences for joint properties are still emerging.

Despite substantial research interest in Al-Cu's dissimilar FSW, a complete fundamental understanding of how these materials can be joined, thrust force may be discussed. This is considerable space for studying heat input, heat distribution, and stress flow on advancing/retreating. Electrical properties of dissimilar Al-Cu joints and techniques to improve should be developed to use in growing battery industries.

2. Review of status of Research and Development in the subject

International Status:

A significant technology transition of the automotive industry in introducing electric drive systems for the commercial market has demanded a new lithium-ion battery technology [1,2]. In the automotive industry, mainly, copper and aluminium are used to manufacture terminals and bus bars for lithium-ion batteries in electric vehicles [3]. Many individual battery cells are assembled in a series configuration by bus bars to be used in these vehicles, forming a battery pack that acts as a high-power source to the system. Conventionally, Al-Cu joints in battery tabs and bus bars are achieved via micro-clinching or mechanical fastening.

Mechanical joining is the most often used technology of conventional Al-Cu joint welding. Mechanical joining techniques such as bolting and riveting [4] increase the structure's weight by incorporating high-strength rivets and bolts. The drilling of holes for bolts and rivets increases stress concentration and influences the structure's fatigue efficiency. The researcher observed that high welding speed produced less heat during the process, which caused improper mixing of Al-Cu material. As a result, incomplete and low-quality weld joints are obtained due to presence of defects like cavities and voids [5]. Saied et al. performed friction stir lap welding on AA1060 aluminium alloy and pure copper to study the influences of different welding speed on tensile shear strength [6]

[1] Das A, Li D, Willams D, Greenwood D. Jointing technologies for automotive battery systems manufacturing. *World Electric Vehicles*, 2018; 9

[2] Hannan M.A, Hoque M.M, Hussain A, Yusof Y, Ker PJ. State of art and energy management system of lithium-ion batteries in electric vehicle applications, issues and recommendations. *IEEE Access* 2018;6:19362-78.

[3] Cai Wayne. Lithium-Ion battery manufacturing for electric vehicles: a contemporary overview. In: Jingshan Li Sz, Han Y, editors. *Batter. Manuf. Syst.* 1st Edition John Wiley & Sons; 2017

[4] He X, Zhao L, Deng C, Xing B, Gu F, Ball A. Self piercing riveting of similar and dissimilar metal sheets of aluminium alloy and copper alloy. *Mater Des.* 2015;65:923-33.

[5] Fotouhi Y, Rasaee S, Askari A, Bisadi H. Properties in dissimilar butt friction stir welding of Al5083-copper sheets. *Eng Solid Mech* 2014;2:239-46.

[6] Saeid T, Abdollah-zadeh A, Sazgari B. Weldability and mechanical properties of dissimilar aluminium-copper lap joints made by friction stir welding. *J Alloys Compd* 2010;490:652-5.

National Status:

Mechanical joining is the most often used technology of conventional Al-Cu joint welding. Mechanical joining techniques such as bolting [1] and riveting increase the structure's weight by incorporating high-strength rivets and bolts. Due to significant differences in physical and metallurgical characteristics, the dissimilar joints of aluminium and copper are prone to form large brittle intermetallic compounds (IMC) at elevated temperatures. The formation of the IMC layer between the Al-Cu interfaces adversely affects the joint's strength and electrical conductivity performance [2]. Since the amount of the IMC layer depends on the heat generated during the joining process, the thickness of this layer is tough to control in conventional welding techniques [3]. Muthu and Jayabalan investigated the welding speed effects on the microstructure of Al-Cu joints produced by FSW [4]. Patel et al. did a numerical simulation of cooling assisted friction stir welding of Al-Cu using heat flux as a stirring tool and linear Newtonian convective cooling [5]. For the cooling procedure, the heat loss was assumed as convective heat transfer.

- [1] Lakshminarayanan AK, Suresh M, Sibi Varshan M. Thermal performance evaluation of friction stir welded and bolted cold plates with Al/Cu interface. *JOM* 2015;67:1032-44.
- [2] Abbasi M, Karimi Taheri A, Salehi M. T. Growth rate of intermetallic compounds in Al/Cu bimetal produced by cold roll welding process. *J Alloys Compd* 2001;319:233-41
- [3] Kah. P, Vimalraj C, Martikainen J, Suoranta R. Factors influencing Al-Cu weld properties by intermetallic compound formation. *Int. J Mech Mater Eng* 2015; 10:10
- [4] Muthu MFX, Jayabalan V. Tool travel speed effects on the microstructure of friction stir welded aluminium – copper joints. *J Mater Process Technology* 2015;217:105-13
- [5] Patel NP, Parlikar P, Singh Dhari R, Mehta K, Pandya M. Numerical modeling on cooling assisted friction stir welding of dissimilar Al-Cu joint. *J Manuf Process* 2019;47:98-109.

Importance of the proposed project in the context of current status

The current collectors of Li-ion batteries are generally composed of dissimilar materials, such as aluminium and copper that have a thickness of 500 µm. In battery pack welding, existing techniques such as ultrasonic and laser are ineffective since the materials are micro-thickness, have the same crystal structure as the face-centred cubic, and are highly reflective materials.

In the present study, friction stir welding is used to join micro sheets of AA1060 and pure copper in a lap configuration. Variations in FSW process parameters affect friction heat generation. The combination of frictional heat and metal diffusion leads to the formation of intermetallic compounds and change in intermetallic compound (IMC) thickness. Considering the FSW in battery pack applications, the joining dissimilar Al-Cu micro sheets have several challenges like controlling the IMC and void formation. Further, this study investigates the optimum process parameters for joining micro sheets of dissimilar materials based on tensile strength, IMC formation, and fatigue analysis.

Additionally, no comprehensive study has been undertaken on fatigue analysis for FSW of Al-Cu joints with a thickness of 500 µm. Based on the applications of electric vehicles, the study on fatigue life of Al-Cu tabs joining is crucial in determining the battery pack life from many external factors, including vibration and damping.

If the project is location specific, basis for selection of location be highlighted:

3. Work Plan:

Methodology:

- The influence of friction stir welding process parameters such as rotational speed and welding speed on the microstructural and mechanical properties of the joints were studied.
- The metallurgical bonding due to the formation of intermetallic compounds and the mechanical interlocking was observed in the present study.
- Strengthening mechanism of the nugget zone was discussed in detail.

Time Schedule of activities giving milestones through BAR diagram.

Total project duration: 36 months.

The research activity related to friction stir welding are investigated. Then, review the collection of data about the project and analysis the details. The process of analysis the friction stir welding related data take around two months. Based on the investigate results, the equipment and raw materials are purchased from the market and erection process takes place in two months. The welding the workpiece as per requirement and testing the properties of workpiece after the welding process. The findings are validated.

| Activity | Months | | | | | | | | | | | | |
|--|--------|---|---|---|---|---|---|----|----|----|----|----|--|
| | 1 | 2 | 3 | 4 | 5 | 6 | 9 | 12 | 18 | 24 | 30 | 36 | |
| Investigate Needs | | | | | | | | | | | | | |
| Review the investigate details | | | | | | | | | | | | | |
| Analysis the collected data | | | | | | | | | | | | | |
| Mobilization of Equipment & Raw material | | | | | | | | | | | | | |
| Testing & Evaluation | | | | | | | | | | | | | |
| Results and discussion | | | | | | | | | | | | | |
| Validated the Findings | | | | | | | | | | | | | |

Suggested Plan of action for utilization of research outcome expected from the project.

| Sl. No | Name of Milestone | Expected Start (Month/Year) | Expected Completion (Month/Year) | Deliverables |
|--------|---|--------------------------------|----------------------------------|---|
| 1. | 1. Meeting with PI and Co-PI(s) 2. Investigate the research data 3. Discussion about the Execution plan | 1 st month/ 2021 | 1 st month/ 2021 | Based on the discussion, the details about the project are collected and reviewed. |
| 2. | Review the collection of data | 1 st month/20X X | 2 nd month/20X X | Based on the collected data, the expected outcome is derived from the collected data. |
| 3. | Mobilization of participants, Equipment & Raw material | 2 nd month/20X X | 4 th month/20X X | STI Hub training the participant using ICT based tools. |
| 4. | Assessment & Evaluation Periodic Review meeting | 4 th month/20X X | 6 th month/20X X | Based on the evaluation result initiating necessary changes in experimental procedure |
| 5. | Implementation of the experimental set-up | 5 th month/20X X | 5 th month/20X X | Analysis of the experimental set-up |
| 6. | Result and discussion | 6 th month/20X X | 6 th month/20X X | Analysis of the results and recommendation of the findings. |
| 7. | Validation of findings | 7 th month/20X X | 36 th month/20X X | Continues follow up measurement and providing necessary guidelines |

Environmental impact assessment and risk analysis.

The dangerous effects of the fumes and radiations generated from conventional welding such as MIG, TIG, etc are reported by several researchers.

In order to avoid health hazard effects of welding process, an environmental friendly process has been invented at The Welding Institute, United Kingdom, which is popularly known as friction stir welding (FSW).

FSW is an environmental friendly process which has no fumes and radiations.

FSW process produces no smoke, fumes, arc glare and it is an eco-friendly welding process.

As far as developing stage of India is concerned, the major construction and fabrication works depend upon welding process and the welders contribute noticeable quantity in percentage of labours.

For future developments in India, FSW may be adopted as a joining process due to its environment friendly aspects and health safety benefits.

Although the FSW tools for steel are expensive.

The limitations of friction stir welding on steels are as follows:

- (i) a very high durable tool is required for welding steels
- (ii) the temperature produced by the tool pin and shoulder will not be sufficient to plasticize the metals
- (iii) welding speed cannot be attained as good as on aluminium alloys due to the high hardness of steels
- (iv) high flow stress is maintained by the hot steels while conducting FSW process, and which causes high contact stress and severe tool degradations.

4. Expertise:

Expertise available with the investigators in executing the project: **Dr.**

P.Gopinath, Principal Investigator:

Publications

1. **P.Gopinath, & P.Suresh**, 2018,,**Effect of Jute Reinforcement Parameter on Mechanical Properties of Composite Structures**“, Journal of Testing and Evaluation, <https://doi.org/10.1520/JTE20170531>. ISSN 0090-3973. (**Impact Factor – 0.669**)
ANNEXURE I & SCI - INDEXED JOURNAL
2. **P.Gopinath, & P.Suresh**, 2014,,**Mechanical Behaviour of Fly Ash Filled, Woven Banana Fiber Reinforced Hybrid Composites as Wood Substitute**“, International Journal of Mechanical and Production Engineering Research and Development (IJMPERD) ISSN (P): 2249-6890; ISSN (E): 2249-8001 Vol. 4, Issue 2, Apr 2014, 111- 116. **SCOPUS INDEXED**.
3. **P.Gopinath**,”**Modelling and Analysis of Thrust Force and Torque in Drilling Natural FRP Composites**“, Proceeding of the national Journal for science and Technology (Tech Scripts), pp 56.
4. **P. Gopinath**,” **Smart Agricultural Farm using IOT (Internet of Things)**“, Proceeding of the International Journal of Engineering Science and Computing, ISSN 2250-1371, Vol 9 Issue No.3 March 2019.
5. **Gopinath Palani & Suresh Paramasivam** “Influence of Laying Angles in Reinforcement of Epoxy in Sisal Plain Woven Structures” **MATERIALS SCIENCE**, <http://dx.doi.org/10.5755/j02.ms.28608>. **Accepted 12 May 2021**.
6. **Dr.P.Gopinath**, Arun Prabakaran J, Gokulnath K Karthick R & Manikandan R “Design and Analysis of Garlic Peeling Machine” International Journal of Advance Research in Science and Engineering, Vol. No.10, Issue No. 04, April 2021, PP 69 – 72.
7. **P. Gopinath**, Nithish M, Monish Kanan M, Saravanan R & Vigneshwaran S “Design and Fabrication of Medical Waste Disposal Machine” International Journal of Advance Research in Science and Engineering, Vol.No.09, Issue No.04, April 2021, PP 129- 134.
8. **Gopinath.P, Mohanraj.A & Suresh.P** “Investigation of Mechanical Properties on Jute Fiber- Epoxy Reinforced Composites Using Taguchi Method” Tierärztliche Praxis, Vol 40, 2020.
9. **Gopinath. P & Suresh. P** “Effect of jute reinforcement parameters on mechanical properties of composite structures” Journal of Testing and Evaluation 47, No.4, PP 2585 – 2595, 2019.
10. **Gopinath. P & Suresh. P** “Mechanical Behaviour of Fly Ash Filled, Woven Banana Fiber Reinforced Hybrid Composites as Wood Substitute” International Journal of Mechanical and Production Engineering Research and Development, Vol. 4, Issue 2, PP 111- 116 , Apr 2014.

Dr.P.Kanakarajan,Co-Investigator

Publications

Kanakarajan P, Sundaram S, Kumaravel S. et. al. 2015. Accoustic emission testing of surface roughness and wear caused by grinding of ceramic materials, Materials Testing, Vol.57, no. 4. Pp.337-342

Kanakarajan,P,Sundaram,S,Kumaravel,A,Rajasekar,R&Venkatachalam,R2016, „Acoustic emission testing of the machining performance of SiC grinding wheel shaped Al₂O₃ ceramics”, Materials Testing, vol. 58, no. 10, pp. 908-912.

Kanakarajan,P,Sundaram,S,Kumaravel,A,Rajasekar,R&Venkatachalam,R2017, „Prediction of the surface roughness and wheel wear of modern ceramic material (Al₂O₃) during grinding using multiple regression analysis model”, Indian Journal of Engineering & Materials Sciences, vol. 24, June 2017, pp. 182-186.

Patents:

1. Accident Prevention System by Electromagnetic Bumper, Patent filled on 03.12.2019, Intellectual Property India, Government of India. Application No: 201941049644. Reference No: E-2/38872019-CHE.

Dr.M.Sivakumar,Co-Investigator Publications

1. SenthilKumar,M.S,**Sivakumar,M**,Rameshkumar,R,AvinashA.(2022)Towards improved performance and lower exhaust emissions using exhaust gas recirculation coupled compression ignition engine fuelled with nanofuel blends. Energy Sources, Part A: Recovery, Utilization, and Environmental Effects, **Published online: 13.02.2022. (Impact factor – 3.447)** (Taylor and Francis Publications)
2. **Sivakumar, M**, Shanmugasundaram, N, Rameshkumar, R. (2020) „Investigation on effects of the exhaust emission characteristics of diesel engine fuelled with mahua oil methyl esters and its blends with diesel“. International Journal of Automotive Engineering and Technologies, Vol. 9, no. 1, pp. 20-28.
3. **Sivakumar, M**, Shanmugasundaram, N, Rameshkumar, R, Syed Thasthagir, M. (2018) Effects of Aluminium oxide nanoparticles blended Pongamia Methyl Ester on Performance,Combustion, andEmission CharacteristicsofDieselEngine.Renewable Energy, Vol. 116, pp. 518-526. **(Impact factor – 8.001)** (Elsevier Publications)

4. **Sivakumar, M**, Shanmugasundaram, N, Rameshkumar, R, Syed Thasthagir, M. (2018) „Effects of Nanoparticles Blended Biodiesel on Single Cylinder CI Engine“, Material Today:Proceedings, Vol. 5, pp. 6831-6838. (Elsevier Publications)
5. **Sivakumar, M**, Shanmugasundaram, N, Rameshkumar, R, Syed Thasthagir, M. (2017) Effects of Pongamia Methyl Esters and its Blends on a Diesel Engine Performance, Combustion, and Emission Characteristics. Environmental Progress & Sustainable Energy, Vol. 36, no.1, pp. 269-276. (**Impact factor – 2.431**) (John Wiley & Sons Publications)

PATENTS:

- Accident Prevention System by Electromagnetic Bumper, Patent filled on 03.12.2019, Intellectual Property India, Government of India. Application No: 201941049644. Reference No: E-2/38872019-CHE
- Fully Automatic Commercial line vehicle assembly line system, Patent filled on 09.02.2022, **Published on 25.02.2022**, Intellectual Property India, Government of India. Application No: 202241007000A.
- Fabrication of E Vehicle with reverse gear mechanism and cruise control system, Patent filled on 13.06.2022, Intellectual Property India, Government of India. Application No: 202241033467.
- Fabrication of Motorized Tri Cylinder Air Compressor, Patent filled on 13.06.2022, Intellectual Property India, Government of India. Application No: 202241033660.

TEXTBOOK

- A chapter entitled “Effectives of Additives on the Performance and Emission Attributes of Diesel engines” was published in the IGI Global book series, Engineering Science Reference, an imprint of IGI Global (February, 2020) ISBN 9781799825401.

Summary of roles/responsibilities for all Investigators:

(If the proposal contains more than one Investigator, it is important to clearly mention the role of each Investigator in implementing the objectives of the proposal. The Board does not encourage Investigators who do not have a specific scientific role in the proposal)

| S. No. | Name of the Investigators | Roles/Responsibilities |
|--------|---------------------------|------------------------|
| 1. | Dr. P.Gopinath | Principal Investigator |
| 2. | Dr.P.Kanakarajan | Co-PI |
| 3. | Dr.M.Sivakumar | Co-PI |

Key publications published by the Investigators pertaining to the theme of the proposal during the last 5 years

Dr.P.Gopinath, Arun Prabakaran J, Gokulnath K Karthick R & Manikandan R “Design and Analysis of Garlic Peeling Machine” International Journal of Advance Research in Science and Engineering, Vol. No.10, Issue No. 04, April 2021, PP 69 – 72.

P. Gopinath, Nithish M, Monish Kanan M, Saravanan R & Vigneshwaran S “Design and Fabrication of Medical Waste Disposal Machine” International Journal of Advance Research in Science and Engineering, Vol.No.09, Issue No.04, April 2021, PP 129- 134.

Gopinath. P , Mohanraj.A & Suresh. P “Investigation Of Mechanical Properties On Jute Fiber- Epoxy Reinforced Composites Using Taguchi Method” Tierärztliche Praxis, Vol 40, 2020.

Gopinath. P & Suresh. P “Effect of jute reinforcement parameters on mechanical properties of composite structures” Journal of Testing and Evaluation 47, No.4, PP 2585 – 2595, 2019.

Senthil Kumar, M.S, **Sivakumar, M**, Rameshkumar, R, Avinash A. (2022) Towards improved performance and lower exhaust emissions using exhaust gas recirculation coupled compression ignition engine fuelled with nanofuel blends. Energy Sources, Part A: Recovery, Utilization, and Environmental Effects, **Published online: 13.02.2022. (Impact factor – 3.447)** (Taylor and Francis Publications)

Sivakumar, M, Shanmugasundaram, N, Rameshkumar, R. (2020) „Investigation on effects of the exhaust emission characteristics of diesel engine fuelled with mahua oil methyl esters and its blends with diesel“. International Journal of Automotive Engineering and Technologies, Vol. 9, no. 1, pp. 20-28.

Sivakumar, M, Shanmugasundaram, N, Rameshkumar, R, Syed Thasthagir, M. (2018) Effects of Aluminium oxide nanoparticles blended Pongamia Methyl Ester on Performance, Combustion, and Emission Characteristics of Diesel Engine. Renewable Energy, Vol. 116, pp. 518-526, **(Impact factor – 8.001)** (Elsevier)

Sivakumar, M, Shanmugasundaram, N, Rameshkumar, R, SyedThasthagir, M.
 (2018), „Effectsof Nanoparticles Blended Biodiesel on Single Cylinder CI Engine”, Material Today:Proceedings, Vol. 5, pp. 6831-6838. (Elsevier Publications)

5. ListofProjectssubmitted/implementedbytheInvestigators

(All the Investigators should list out details of the Projects submitted, implementing and completed by them. The list should start with the Projects implemented by the Principal Investigator, followed by Co-PII, Co-PI 2 etc.)

Detailsof Projectssubmittedto variousfunding agencies:

| S.No | Title | Costin Lakh | Month of submission | RoleasPI/Co-PI | Agency | Status |
|------|-------|-------------|---------------------|----------------|--------|--------|
| - | - | - | - | - | - | - |
| - | - | - | - | - | - | - |

DetailsofProjectssunder implementation

| S.No | Title | Costin Lakh | Duration | RoleasPI/Co-PI | Agency |
|------|-------|-------------|----------|----------------|--------|
| - | - | - | - | - | - |
| - | - | - | - | - | - |

DetailsofProjectsscompletedduringthe last 5years

| S.No | Title | Costin Lakh | Duration | RoleasPI/Co-PI | Agency |
|------|-------|-------------|----------|----------------|--------|
| - | - | - | - | - | - |
| - | - | - | - | - | - |

6. Listoffacilitiesbeingextendedbyparentinstitution(s)forthe project implementation.

InfrastructuralFacilities

| Sr. No. | InfrastructuralFacility | Yes/No/NotrequiredFull or sharing basis |
|---------|---|---|
| 1. | Workshop Facility | YES |
| 2. | Water&Electricity | YES |
| 3. | LaboratorySpace/Furniture | YES |
| 4. | PowerGenerator | YES |
| 5. | ACRoom or AC | YES |
| 6. | Telecommunicationincludinge-mail&fax | YES |
| 7. | Transportation | YES |
| 8. | Administrative/Secretarialsupport | YES |
| 9. | InformationfacilitieslikeInternet/Library | YES |
| 10. | Computationalfacilities | YES |

| | | |
|-----|--|------------|
| 11. | Animal/GlassHouse | YES |
| 12. | Anyotherspecial facilitybeing provided | |

EquipmentavailablewiththeInstitute/Group/Department/OtherInstitutes for the project:

| Equipmen tavailable with | GenericName of Equipment | Model, Make & year ofpurchase | Remarks including accessoriesavailableand current usage of equipment |
|---------------------------------|---------------------------------|--|---|
| PI&hisgroup | | | |
| PI's | | | |

7. Nameandaddressofexperts/institutioninterestedinthesubject/outcomeof the project.

8. PreviousProjectsDetails(If Any)

| S. No | Project Title | PI Name | CO-PI Name | Amount | Status | DateOf Start | Date Of Completion | Funding Agency |
|--------------|----------------------|----------------|-------------------|---------------|---------------|---------------------|---------------------------|-----------------------|
| - | - | - | - | - | - | - | - | - |
| - | - | - | - | - | - | - | - | - |

Budget Details

Institution wise Budget Breakup :

| Budget Head | K S R INSTITUTE FOR ENGINEERING AND TECHNOLOGY | Total |
|--------------------|--|------------------|
| Research Personnel | 7,20,000 | 7,20,000 |
| Consumables | 3,00,000 | 3,00,000 |
| Travel | 0 | 0 |
| Equipment | 16,00,000 | 16,00,000 |
| Other cost | 75,000 | 75,000 |
| Overhead | 1,50,000 | 1,50,000 |
| Total | 28,45,000 | 28,45,000 |

Institute Name : ***K S R INSTITUTE FOR ENGINEERING AND TECHNOLOGY***

Year Wise Budget Summary(Amount in INR) :

| Budget Head | Year-1 | Year-2 | Year-3 | Total |
|--------------------|------------------|-----------------|-----------------|------------------|
| Research Personnel | 2,40,000 | 2,40,000 | 2,40,000 | 7,20,000 |
| Consumables | 1,00,000 | 1,00,000 | 1,00,000 | 3,00,000 |
| Travel | 0 | 0 | 0 | 0 |
| Equipments | 16,00,000 | 0 | 0 | 16,00,000 |
| Other cost | 25,000 | 25,000 | 25,000 | 75,000 |
| Overhead | 50,000 | 50,000 | 50,000 | 1,50,000 |
| Grand Total | 20,15,000 | 4,15,000 | 4,15,000 | 28,45,000 |

Research Personnel Budget Detail (Amount in INR) :

| Designation | Year-1 | Year-2 | Year-3 | Total |
|---|----------|----------|----------|-----------------|
| Research Associate-I <i>M.E.inMechanicalEngineering/ManufacturingTechnology</i> | 2,40,000 | 2,40,000 | 2,40,000 | 7,20,000 |

Consumable Budget Detail (Amount in INR) :

| Justification | Year-1 | Year-2 | Year-3 | Total |
|---|----------|----------|----------|-----------------|
| <i>Duringtheweldingprocess,theconsumablesareutilized.</i> | 1,00,000 | 1,00,000 | 1,00,000 | 3,00,000 |

Travel Budget Detail (Amount in INR) :

| Justification (Inland Travel) | Year-1 | Year-2 | Year-3 | Total |
|-------------------------------|--------|--------|--------|----------|
| <i>NIL</i> | 0 | 0 | 0 | 0 |

Equipment Budget Detail (Amount in INR) :

| Generic Name ,Model No. , (Make)/ Justification | Quantity | Spare time | Estimated Cost |
|---|----------|------------|------------------|
| NC Friction Stir Welding Machine <i>FSWB10 (RV Machine tools)</i> <i>Thefrictionstirweldingmachineisusedforweldingthedissimilarmaterials.</i> | 1 | 25 % | 16,00,000 |

Overhead Budget Detail (Amount in INR) :

| Justification | Year-1 | Year-2 | Year-3 | Total |
|-----------------------------------|--------|--------|--------|-----------------|
| <i>Institutionoverheadcharges</i> | 50,000 | 50,000 | 50,000 | 1,50,000 |

Other Budget Detail (Amount in INR) :

| Description/Justification | Year-1 | Year-2 | Year-3 | Total |
|---------------------------|--------|--------|--------|---------------|
| Process cost | 25,000 | 25,000 | 25,000 | 75,000 |
| Unexpected cost | | | | |

| | | | | |
|--------------------------------------|--|---------------------|-------------------------------------|---|
| Name | Dr.P.GOPINATH | | |  |
| Designation & Department | ASSISTANT PROFESSOR & MECHANICAL ENGINEERING | | | |
| Qualification | B.E.,M.E.,MBA.,Ph.D. | | | |
| Area of Specialization | CAD | | | |
| Date of Joining (KSRIET) | 01.07.2011 | | | |
| Experience (as on 01.01.2018) | Teaching:19 | Industry:NIL | Others:NIL | |
| Number of Papers Published | National Journals | 02 | International Journals | 02 |
| Number of Papers Presented | National Conferences:11 | | International Conferences:09 | |
| Books Published | National Publisher | 02 | International publisher | :NIL |
| Contact Details | EMail:gopipalani@ksriet.ac.in | | Mobile:9500998458 | |

Publications(International Journals)

1. P.Gopinath,A.Mohanraj&P.Suresh
 “Investigation of mechanical properties of jute fibre epoxy reinforced composites using Taquchi method” International Journal of Tierarztliche Praxis, Vol-9:Issue-3 ISSN-0303-6286.
2. P.Gopinath,&P.Suresh, 2018,
 ‘Effect of Jute Reinforcement Parameter on Mechanical Properties of Composite Structures’, Journal of Testing and Evaluation, <https://doi.org/10.1520/JTE20170531>.
 ISSN 0090 - 3973. (Impact Factor – 0.669) ANNEXURE I & SCI-INDEXED JOURNAL
3. P.Gopinath,&P.Suresh, 2014,
 ‘Mechanical Behaviour of Fly Ash Filled, Woven Banana Fiber Reinforced Hybrid Composites as Wood Substitute’, International Journal of Mechanical and Production Engineering Research and Development (IJMPERD) ISSN(P):2249-6890; ISSN(E):2249-8001 Vol.4, Issue 2, Apr 2014, 111-116. SCOPUS INDEXED.

Publications(National Journals)

1. P.Gopinath, ”Modelling and Analysis of thrust force and Torque in Drilling Natural FRP Composites”, Proceeding of the national Journal for science and Technology (Tech Scripts), pp 56.

2. **P.Gopinath,"SmartAgriculturalFarmusingIOT(InternetofThings)",** Proceeding of the International Journal of Engineering Science and Computing, ISSN 2250-1371, Vol 9 Issue No.3 March 2019.

Publications(InternationalConferences)

1. **P.Gopinath,“AnalysisofThrustForceandTorqueinDrillingNaturalFRPCComposites”**, Processing of the international conference on Advance in Civil and Mechanical Engineering in (ACME-2014).
2. **P.Gopinath,“DelaminationAnalysisofJuteFiberComposites”**, Proceedings of the international conference on Modelling, Simulation and Control in (ICMSC-2015).
3. **P.Gopinath,“EcofriendlyCharacterizationofCompositeMaterials”**,Proceedings of the international conference on Innovative Engineering Skills in (ACETIC-2014).
4. **P.Gopinath,“InvestigationofMechanicalPropertiesandbehaviourofStirCastAL-alloybasedComposites”**, Proceedings of the international conference on Civil, Mechanical, Chemical Engineering and Technologies - 2018 in (ICCMCT - 2018).
5. **P.Gopinath,“CharacterizationofJute–EpoxyReinforcedComposites”**, Processing of the international Conference on Innovations in Science, Engineering and Technology for Sustainable Development in (ISETSD-2018).
6. **P.Gopinath,“OptimizationofMechanicalPropertiesusingRidgeGourd,SisalandJuteFibres”**, Processing of the international Conference on Innovations in Science, Engineering and Technology for Sustainable Development in (ISETSD- 2018).
7. **P.Gopinath,“JuteFibreandRidgeGourd,CompositesusingVinylester”**, Proceedings of the international Conference on Advanced Manufacturing and Automation in (INCAMA-2018).
8. **P.Gopinath,“SmartAgriculturalFarmusingIOT(InternetofThings)”**, Proceeding of the international Conference on Innovative Engineering Initiatives in (ICIEI-2019).
9. **P.Gopinath,“SoilTestingforSmartAgricultureusingArduinoUNO”**, ProceedingoftheinternationalConferenceonSustainableMaterialsin(ICSM-2019).

Publications(NationalConferences)

1. **P.Gopinath,“ModellingandAnalysisofThrustForceandTorqueinDrillingGFRPComposites”**, Proceeding of the national Conference on Mechatronics and Mechanical Systems in (NCMMS-2013).
2. **P.Gopinath,“ModellingandAnalysisofThrustForceandTorqueinDrillingGFRPComposites”**, Proceeding of the national Conference on Recent Trends in Engineering and Technology in (NCRTE-2013).
3. **P.Gopinath,“ModellingandAnalysisofThrustForceandTorqueinDrillingGFRPComposites”**, Proceeding of the national Conference on Emerging Trends in Engineering and Technology in (ETET-2014).
4. **P.Gopinath,“DevelopmentofFractureFixationPlateusingNaturalCompositeMaterials”**, Proceeding of the national Conference on Modern Trends in Mechanical Engineering in (MTME-2014).
5. **P.Gopinath,“ComparisonofThrustForceandTorqueinDrillingCompositeMaterialsbyExperimentalAnalyticalandFuzzyLogic”**, Proceeding of the national Conference on Recent Inventions in Dynamic Engineering in (RIDE-2015).

6. **P.Gopinath, “CFD Combustion Analysis of Hydrogen Supplement with Diesel Fuel in C I Engine”**, Proceeding of the national Conference on Computational Fluid Dynamics Applications in Biotechnology Process in (DST-2015).
7. **P.Gopinath, “Failure Analysis in Composite Material Using Lamb wave Methods”**, Proceedings of the ISTE Sponsored National conference on Innovations in Engineering and Technology (NCIET-2017).
8. **P.Gopinath, “Green Manufacturing Analysis in Composite Material”**, Proceedings of the ISTE Sponsored National conference on Innovations in Engineering and Technology (ITME-2017).
9. **P.Gopinath, “Optimization of Mechanical Properties Using Ridge Guard, Sisal and Jute Fibres”**, Proceeding of the Project Expo ENTHIRA – 17 Sponsored by SOCIETY OF AEROSPACE AND MECHANICAL PROFESSIONALS (SAMP).
10. **P.Gopinath, “Design and Analysis of Heavy Vehicle Head Light Frame Using Banana Fibre Composite Material.”** Proceeding of the Project Expo ENTHIRA – 17 Sponsored by SOCIETY OF AEROSPACE AND MECHANICAL PROFESSIONALS (SAMP).
11. **P.Gopinath, “Study on Performance Analysis of IC Engine Fins”**, Proceeding of the national Conference on Energy & Environment in (NCONEE-2018).

Books/Instruction materials/monogram published

| S.No | Title of the Book | Author(s) | Name & Address of the Publisher | Year of Publishing |
|------|--|---------------------------------|---------------------------------|--------------------|
| 1. | Unconventional machining processes | Dr.P.Murugesan Dr.P.Gopinath | M.G.Publications | 2016 |
| 2. | Basic civil and Mechanical Engineering | Dr.P.Murugesan Dr.P.Gopinath | Anuradha Publications | 2017 |

Funded Research Projects

| S.No | Title of the Project | Name of the Funding Agency | Amount Sanctioned (Rs.) | Role |
|------|----------------------|----------------------------|-------------------------|------|
| 1. | -- | -- | -- | -- |

Funded Programmes Organized (Seminar/Conference/Workshop/FDP/STTP/Other)

1. Two days National Seminar on “**Consumable through Composites Processing and Preparation**” during 6th January to 7th January 2012. at Kongu Engineering College, Perundurai.
2. Three days Workshop on “**Handson Training on Modelling and Simulation using MATLAB– Simulink and Soft Tools**” during 14th September to 16th September 2012. At Kongu Engineering College, Perundurai.
3. Two days National Seminar on “**Heat Exchanger and its Applications**”, 8th November & 9th November, 2012 at K S R Institute for Engineering and Technology, Tiruchengode
4. Three days National Symposium on Acoustics “**Design and Analysis of Flexible Carping**”, 5th December to 7th December, 2012 at K S R Institute for Engineering and Technology, Tiruchengode.
5. One day National Seminar on “**Characterization and Application of Composite Materials**”, 10th March, 2014 at N.S.N College of Engineering and Technology, Karur.
6. One day Seminar on “**Writing Effective Research Paper(S) and Thesis**”, 19th July 2014 at K S R College of Engineering, Tiruchengode.
7. One-week Faculty Development Training Programme on “**ME2036- Production Planning and Control**”, 17th December to 23rd December 2014 at Karpagam College of Engineering, Coimbatore.
8. One day Workshop on “**Composite Materials and its Technology Innovation**”, 22nd July 2015 at Karpagam College of Engineering, Coimbatore.
9. One day Workshop on “**Intelligent Product Design and Manufacturing**”, 24th August 2015 at Karpagam College of Engineering, Coimbatore.
10. One day Workshop on “**Robotics in Industrial Automation (RIA-2015)**”, 20th November 2015 at Karpagam College of Engineering, Coimbatore.
11. One day Workshop on “**Environmental Pollution and Control (EPC-2015)**”, 21st November 2015 at Karpagam College of Engineering, Coimbatore.
12. One day Workshop on “**Safety and Security in Automobiles (SSA-2015)**”, 24th November 2015 at Karpagam College of Engineering, Coimbatore.
13. Two days Workshop on “**Manufacturing Process and Application of Advanced Composite Materials**”, 14th and 15th February 2017 at Karpagam College of Engineering, Coimbatore.
14. One day International Workshop on “**Writing and Publishing Research Papers in High Impact Factor Journals**” 17th August 2017 at Hindustan College of Engineering and Technology, Coimbatore.
15. One day National Workshop on “**Application of Mathematical Modelling and Simulation in Engineering Problems**”, 31st August 2017 at Muthayammal Engineering College, Rasipuram.
16. One day National Seminar on “**Human Factors and Ergonomics in Healthcare and Patient Safety**”, 14th September

17. Two days National Seminar on “Recent Advances in Cryogenics and its Industrial Applications”, 6th October & 7th October 2017 at Muthayammal Engineering College, Rasipuram.
18. One day Workshop on “Tips for writing research proposals, journal papers and patent filing”, 27th February 2018 at K S R Institute for Engineering and Technology, Tiruchengode.
19. One-week Faculty Development Programme on Fundamentals of “Pedagogy in Engineering Education”, 14th May to 19th May 2018 at Karpagam College of Engineering, Coimbatore.
20. One-week Faculty Development Training Programme on “ME6701- Power Plant Engineering”, 4th June to 10th June 2018 at Gnanamani College of Technology, Namakkal.
21. Three days Workshop on “Instructional and Assessment Characteristics of OBE Framework and Hands-on Practices for Designing and Mapping Outcomes”, 19th November to 21st November 2019 at K S R Institute for Engineering and Technology, Tiruchengode.
22. Three days Research Conclave on “Testing and Evaluation of Mechanical Properties on Jute Fibre Plain Woven Fabric Composite Structures”, conducted by Teaching Learning Centre, CIT Coimbatore January 2020. RSC ID – 33, Track ID– MS – 429 Dated: 10.01.2020, 2.30PM to 5.00PM.

Consultancy Activities (Industry)

| S.No | Title of the Project | Name of the Company |
|------|----------------------|---------------------|
| 1. | | |

Training Offered

NIL


Membership in Professional Bodies

- Indian Society for Technical Education (ISTE)-Life Member (LM42264)

Subject Links

1. Unconventional Machining Process

<https://books.google.co.in/books?id=uC3rHzhogmMC&printsec=frontcover&dq=Unconventional+Machining+Process&hl=en&sa=X&ved=0ahUKEwib6syEwpPZAhWMso8KHWGDBZQQ6AEILjAC#v=onepage&q=Unconventional%20Machining%20Process&f=false>

| | | | | |
|--------------------------------------|---|-----------------------------------|------------------------------------|---|
| Name | Dr.P.KANAKARAJAN | | |  |
| Department | MechanicalEngineering | | | |
| Qualification | B.E.M.E.,PhD., | | | |
| Area of Specialization | PRODUCTIONTECHNOLOGY&ACOUSTIC EMISSION TECHNIQUE | | | |
| DateofJoining (KSR IET) | 01.04.2021 | | | |
| Experience (as on 30.04.2021) | Teaching: 29Years8Months | Industry:00 | Others:00 | |
| Number of PapersPublished | NationalJournals :00 | InternationalJournals 03 | | |
| Number of PapersPresented | NationalConferences:00 | | InternationalConferences:00 | |
| Books Published | NationalPublisher:00 | Internationalpublisher :01 | | |
| ContactDetails | EMail:kanagu.dhana@ksriet.ac.in Mobile:9842555119 | | | |

Title of Ph.D. Thesis : Experimental investigation on surface roughness of machined alumina and simultaneous wear of silicon carbide grinding wheel by using acoustic emission technique.

FacultyinwhichPh.D.wasawarded :Facultyof Mechanical Engineering

RecognizedPh.D.Supervisor

- AnnaUniversitySupervisorRef.No.:3320071,Chennai–600025,TamilNadu, INDIA.

Publications(InternationalJournals)

1. **Kanakarajan,P**, Sundaram,S, Kumaravel,A, Rajasekar,R & Sathishkumar, P 2015, ‘Acoustic emission testing of surface roughness and wear caused by grinding of ceramic materials’, Materials Testing, vol. 57, no. 4, pp.337-342.
2. **Kanakarajan, P**, Sundaram, S, Kumaravel, A, Rajasekar, R & Venkatachalam, R 2016, ‘Acoustic emission testing of the machining performance of SiC grinding wheel shaped Al₂O₃ceramics’, Materials Testing, vol. 58, no. 10, pp. 908-912.
3. **Kanakarajan, P**, Sundaram, S, Kumaravel, A, Rajasekar, R & Venkatachalam, R 2017, ‘Prediction of the surface roughness and wheel wear of modern ceramic material (Al₂O₃) during grinding using multiple regression analysis model’, Indian Journal of Engineering & Materials Sciences, vol. 24, June 2017, pp. 182-186.

Books/Instructionmaterials/monogramspublished

| S.No | TitleoftheBook | Author(s) | Name&Addressofthe Publisher | Year of Publishing |
|-------------|---|---|--|---------------------------|
| 1. | “Electrochemical Super Capacitors Fabricatedbythe Layer-by-Layer (LbL) Technique” | P.Kanagarajan C.Moganapriya, P.SathishKumar & SamirKumarPal | Materials Research Forum LLC 26 (doi.org/10.21741/9781945291579-8),Chapter8, pp. 236 –262. | 2018 |

NPTELOnlineCertificationCourse:

1. ‘Fundamentals of Manufacturing Processes’, P. Kanakarajan, Jul – Oct 2019, for successfully completed with Elite from Indian Institute of Technology, Roorkee.

Patents:

1. Accident Prevention System by Electromagnetic Bumper, Patent filled on 03.12.2019, Intellectual Property India, Government of India. Application No: 201941049644. Reference No: E-2/38872019-CHE.

MembershipofProfessional Bodies:

- LifeMembership, IndianSocietyforTechnicalEducation(ISTE)India.
- LifeMembership,MIE.

Listof Short TermCourses Organized:

| Sl. No. | DetailsofShorttermCourses/ConferencesOrganized |
|----------------|---|
| 1. | Coordinatorforaworkshopon“AdvancedICEngines”,underSelf-FinancedCategory, conductedatK.S.R.CollegeofEngineering,Tiruchengode,Namakkal,during23–24, February2017. |
| 2. | Coordinatorforaworkshopon“EnvironmentalSustainabilitythroughResearchand Development”,underSelf-FinancedCategory,conductedatK.S.R.CollegeofEngineering, Tiruchengode, Namakkal, on 09, September 2016. |
| 3. | Coordinatorforaworkshopon“AutomotiveEngineandVehicleTechnology”under Self-FinancedCategory,conductedatK.S.R.CollegeofEngineering,Tiruchengode, Namakkal, on 12 August 2015. |
| 4. | Coordinatorforaworkshopon“PresentScenarioofAutomobileIndustries”under Self-FinancedCategory,conductedatK.S.R.CollegeofEngineering,Tiruchengode, Namakkal, on 10 January 2015. |
| 5. | CoordinatorforaNationalLevel TechnicalSymposiumconductedatK.S.R. Collegeof Engineering,Tiruchengode,Namakkal,on22August2014. |
| 6. | Coordinatorforaonedayseminaron“RecentTrendsinAutomobileElectronics” underSelf-Financed Category, conducted at K.S.R. College of Engineering, Tiruchengode, Namakkal,on07October2013. |
| 7. | Coordinatorforaonedayseminaron“LatestTechnologiesinAutomobileIndustries”, under Self-Financed Category, conducted at K.S.R. College of Engineering, Tiruchengode, Namakkal, on 19 January 2013. |
| 8. | Coordinator for a one day seminar on “Best Practices in Automobile Industry”, underSelf-FinancedCategory,conductedatK.S.R.CollegeofEngineering,Tiruchengode, Namakkal, on 04 July2012. |
| 9. | Coordinator for a workshop on “New Frontiers in Research Computing”, under Self-FinancedCategory,conductedatK.S.R.CollegeofEngineering,Tiruchengode, Namakkal, during03– 04, February2012. |
| 10. | Coordinatorforaonedayseminaron“VehicleDynamicsandTesting”,underSelf-FinancedCategory,conductedatK.S.R.CollegeofEngineering,Tiruchengode, Namakkal,on 28 January2012. |
| 11. | Coordinatorforaonedayseminaron“EmissionControlMethodsandNormsfor Automotive Vehicles”, under Self-Financed Category, conducted at K.S.R. College of Engineering, Tiruchengode, Namakkal, on 20 December 2011. |

Listof Short TermCourses Attended:

| Sl. No. | DetailsofShorttermCourses/Seminars/WorkshopsAttended |
|----------------|--|
| 1. | MHRD sponsored Faculty Development Programme on “Fundamentals of |

| | |
|----|--|
| | manufacturing processes” organized by NPTEL-AICTE from July 2019 to October 2019. |
| 2. | One day workshop on “Outcome Based Education” organized by K.S.R. College of Engineering, Thiruchengode, Namakkal, Tamilnadu on 01 November 2018. |
| 3. | A National level workshop on “Big data analytics, Artificial Intelligence, Machine learning and Deep Learning” organized by K.S.R. College of Engineering, Thiruchengode, Namakkal, Tamilnadu on 31 October 2018. |
| 4. | A One Day National level workshop on “Writing Successful Proposal to Funding Agencies” organized by K.S.R. Institute For Engineering and Technology, Thiruchengode, Namakkal, Tamilnadu on 31 August 2018. |
| 5. | A National level Workshop on “Industrial Automation using – PLC program” organized by Department of Mechanical Engineering, Nandha College of Technology, Erode, Tamilnadu from 02 August to 03 August 2017. |
| 6. | One day seminar on “Patent Filing in India and other Countries” organized by K.S.R. College of Engineering, Thiruchengode, Namakkal, Tamilnadu on 08 August 2016. |
| 7. | A International level workshop on “Journal Paper Writing and Preparation of Winner Research Proposal” organized by K.S.R. College of Engineering, Thiruchengode, Namakkal, Tamilnadu from 19 August to 20 August 2016. |
| 8. | A National level Workshop on “Blooms Taxonomy and its Assessments” organized by K.S.R. College of Engineering, Thiruchengode, Namakkal, Tamilnadu on 20 March 2015. |

PROFORMA FOR BIO-DATA

| 1. Name and full correspondence address | | Dr.M.SIVAKUMAR 280,K.P.NadarComplex, Subramaniyapuram, Mohanur (PO), Namakkal(Dist) -637015 TAMILNADU. | | | |
|---|--------|---|---|---|------------|
| 2. Email(s) and contact number(s) | | kpmshiva@gmail.com & 9944651425 | | | |
| 3. Institution | | K.S.R.College of Engineering Tiruchengode, Namakkal-637215 TAMILNADU. | | | |
| 4. Date of Birth | | 14/06/1976 | | | |
| 5. Gender (M/F/T) | | MALE | | | |
| 6. Category Gen/SC/ST/OBC | | OBC | | | |
| 7. Whether differently abled (Yes/No) | | No | | | |
| 8. Academic Qualification (Undergraduate Onwards) | | | | | |
| S. No. | Degree | Year | Subject | University/Institution | % of marks |
| 1 | B.E. | 1997 | Mechanical Engineering | Bharathiyar University, V.L.B. Janaki Ammal College of Engineering and Technology, Coimbatore, Tamilnadu, India. | 64% |
| 2 | M.E. | 2004 | Mechanical Engineering /Energy Engineering and Management | Annamalai University, Chidambaram, Tamilnadu, India. | 8.5 CGPA |
| 3 | Ph.D. | 2018 | Mechanical Engineering | Anna University, Chennai. | - |

| 9. Ph.D. thesis title, Guide's Name, Institute/Organization/University, Year of Award. | | | | |
|--|--|------------------------|--|---------------|
| S. No. | Ph.D. Thesis title | Guide's Name | University/Institution | Year of Award |
| 1 | Experimental Investigation on the Influence of Nanoparticles and Exhaust gas Recirculation on Diesel Engine Fueled with Pongamia Methyl Ester Blends with Diesel | Dr.N.Shanmuga Sundaram | Anna University, Chennai / SVS College of Engineering, Coimbatore, TAMILNADU | 2018 |

10. Work experience (in chronological order)

| S. No. | Positions held | Name of the Institute | From | To | Pay Scale |
|--------|---------------------|--|------------|------------|---------------------|
| 1 | Associate Professor | K.S.R. College of Engineering (Autonomous) | 01-09-2015 | - | 37400-67000+AGP9000 |
| 2 | Assistant Professor | K.S.R. College of Engineering (Autonomous) | 20-09-2010 | 31-08-2015 | 15600-39100+AGP8000 |
| 3 | Assistant Professor | Thirumalai Engineering College | 02-06-2008 | 09-09-2010 | 15600-39100+AGP8000 |

11. Professional Recognition/Award/Prize/Certificate, Fellowship received by the applicant

| S. No. | Name of Award | Awarding Agency | Year |
|--------|---------------|-----------------|------|
| NIL | | | |

12. Publications(List of papers published in SCI Journals, in year wise descending order).

| S. No. | Author(s) | Title | Name of the Journal | Volume | Page | Year |
|--------|---|--|---|---------------|-----------|------|
| 1. | M. Sivakumar Dr.N.Shanmuga Sundaram Dr.R.Ramesh kumar M. Syed Thasthagir | Effect of aluminium oxide nanoparticles blended pongamia methyl ester on performance, combustion and emission characteristics of diesel engine | Renewable Energy | Vol. 116 | 518-526 | 2018 |
| 2. | M. Sivakumar Dr.N.Shanmuga Sundaram Dr.R.Ramesh kumar M.Syed Thasthagir | Effects of nanoparticles blended biodiesel on single cylinder CI engine | Materials Today: Proceedings | Vol. 5 No. 2 | 6831-6838 | 2018 |
| 3. | M. Sivakumar Dr.N.Shanmuga Sundaram Dr.R.Ramesh kumar M. Syed Thasthagir | Effects of pongamia methyl esters and its blends on a diesel engine performance, combustion, and emission characteristics | Environmental Progress & Sustainable Energy | Vol. 36 No. 1 | 269-276 | 2017 |

13. Detail of patents

| S. No. | Patent Title | Name of Applicant(s) | Patent No. | Award Date | Agency/ Country | Status |
|--------|--|--|----------------------------------|------------|-----------------|--------|
| 1. | Accident Prevention System by Electromagnetic Bumper | Dr.R. Ramesh Kumar Dr. P. Kanakarajan Dr.M. Sivakumar M.Syed Thasthagir S. Soundararajan | 201941049644 E-2/38872019-CHE | 03.12.2019 | INDIA | Filed |

14. Books/Reports/Chapters/Generalarticlesetc.

| S.No | Title | Author'sName | Publisher | Yearof Publication |
|------|--|--|--|--------------------|
| 1. | EffectivesofAdditiveson thePerformanceand Emission AttributesofDieselengines | Dr.N. Shanmuga Sundaram Dr.M. Sivakumar | IGIGlobal book series, EngineeringScience Reference,an imprint ofIGIGlobal(ISBN 9781799825401) | 2020 |

15. Anyother Information (maximum500 words)

My research interests include alternative fuels for internal combustion engines. In order to reduce the dependency on fossil fuels and to enhance our global environment, fuel modification technique is ideal compared to other techniques. My current research work focused on some potential additives blended with both diesel and biodiesel fuels to improve the fuel properties and use in diesel engine. Furthermore, the whole investigation can be carried out in a variable compression ratio multi fuel engine to determine its performance, emission and combustion characteristics using blended fuels.

Certificate from the Investigator

Project Title: Experimental Investigation on Joining Various Alloy Materials using Friction Stir Welding

It is certified that


1. The same project proposal has not been submitted elsewhere for financial support.
2. We/I undertake that spare time on equipment procured in the project will be made available to other users.
3. We/I agree to submit a certificate from Institutional Biosafety Committee, if the project involves the utilization of genetically engineered organisms. We/I also declare that while conducting experiments, the Biosafety Guidelines of Department of Biotechnology, Department of Health Research, GOI would be followed in to.
4. We/I agree to submit ethical clearance certificate from the concerned ethical committee, if the project involves field trails/experiments/exchange of specimens, human & animal materials etc.
5. The research work proposed in the scheme/project does not in any way duplicate the work already done or being carried out elsewhere on the subject.
6. We/I agree to abide by the terms and conditions of SERB grant.


Name and signature of Principal Investigator:

Dr.P.Gopinath

Date: 19.09.2022

Place: Tiruchengode



Name and signature of Co-PI (s) (if any):

Dr.P.Kanakarajan

Dr.M.Sivakumar

Date: 19.09.2022

Place: Tiruchengode

R. Srinivasan B.B.M.,
Chairman cum Managing Trustee

Dr. M. Venkatesan, M.E., Ph.D.,
Principal


Ref. No.: KSRIET/ SERB SURE Project Proposal/ MECH/ 2022-2023/03

Date: 19.09.2022

Endorsement from the Head of the Institution of PI

This is to certify that:

1. Institute welcomes participation of Name: **Dr.P.Gopinath** Designation: **Associate Professor** as the Principal Investigator and **Dr.P.Kanakarajan, Dr.M.Sivakumar** as the Co-Investigator/s for the project titled **Experimental Investigation on Joining various Alloy Materials using Friction Stir Welding** and that in the unforeseen event of discontinuance by the Principal Investigator, the Co-Investigator will assume the responsibility of the fruitful completion of the project with the approval of SERB.
2. The PI, **Dr.P.Gopinath** is a permanent or regular employee of this Institute/University/Organization and has 16 years of regular service left before superannuation.
3. The project starts from the date on which the University/Institute/ Organization/College receives the grant from SCIENCE & ENGINEERING RESEARCH BOARD (SERB), New Delhi.
4. The investigator will be governed by the rules and regulations of University/Institute/Organization/College and will be under administrative control of the University/Institute/Organization/College for the duration of the project.
5. The grant-in-aid by the SCIENCE & ENGINEERING RESEARCH BOARD (SERB), New Delhi will be used to meet the expenditure on the project and for the period for which the project has been sanctioned as mentioned in the sanction order.
6. No administrative or other liability will be attached to SCIENCE & ENGINEERING RESEARCH BOARD (SERB), New Delhi at the end of the project.
7. The University/Institute/Organization/College will provide basic infrastructure and other required facilities to the investigator for undertaking the research project.
8. The University/ Institute/Organization/College will take into its books all assets created in the above project and its disposal would be at the discretion of SCIENCE & ENGINEERING RESEARCH BOARD (SERB), New Delhi.
9. The University/Institute/Organization/College assumes to undertake the financial and other management responsibilities of the project.


Signature of Head of the Institute
Dr. M. VENKATESAN, M.E., Ph.D.,
PRINCIPAL,
K S R INSTITUTE FOR
ENGINEERING AND TECHNOLOGY,
K.S.R. KALVI NAGAR,
TIRUCHENGODE-637 215,
NAMAKKAL DI, TAMIL NADU.

Undertaking by the Principal Investigator

To

The Secretary
SERB,
New Delhi

Sir

I **Dr. P.GOPINATH, Associate Professor, Department of Mechanical Engineering**, here by certify that the research proposal titled **Experimental Investigation on Joining various Alloy Materials using Friction Stir Welding** submitted for possible funding by SERB, New Delhi is my original idea and has not been copied/taken verbatim from anyone or from any other sources. I further certify that this proposal has been checked for plagiarism through a plagiarism detection tool i.e. **Urkund** approved by the Institute and the contents are original and not copied/taken from any one or many other sources. I am aware of the UGC's Regulations on prevention of Plagiarism i.e. University Grant Commission (Promotion of Academic Integrity and Prevention of Plagiarism in Higher Educational Institutions) Regulation, 2018. I also declare that there are no plagiarism charges established or pending against me in the last five years. If the funding agency notices any plagiarism or any other discrepancies in the above proposal of mine, I would abide by what so ever action taken against me by SERB, as deemed necessary.


Signature of PI with date

Dr.P.GOPINATH
Associate Professor

Certificate from the Investigator

Project Title: Experimental Investigation on Joining Various Alloy Materials using Friction Stir Welding

It is certified that

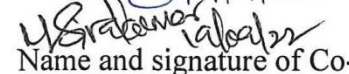
1. The same project proposal has not been submitted elsewhere for financial support.
2. We/I undertake that spare time on equipment procured in the project will be made available to other users.
3. We/I agree to submit a certificate from Institutional Biosafety Committee, if the project involves the utilization of genetically engineered organisms. We/I also declare that while conducting experiments, the Biosafety Guidelines of Department of Biotechnology, Department of Health Research, GOI would be followed in to.
4. We/I agree to submit ethical clearance certificate from the concerned ethical committee, if the project involves field trails/experiments/exchange of specimens, human & animal materials etc.
5. The research work proposed in the scheme/project does not in any way duplicate the work already done or being carried out elsewhere on the subject.
6. We/I agree to abide by the terms and conditions of SERB grant.


Name and signature of Principal Investigator:

Dr.P.Gopinath

Date: 19.09.2022

Place: Tiruchengode



Name and signature of Co-PI (s) (if any):

Dr.P.Kanakarajan

Dr.M.Sivakumar

Date: 19.09.2022

Place: Tiruchengode

R. Srinivasan B.B.M.,
Chairman cum Managing Trustee

Dr. M. Venkatesan, M.E., Ph.D.,
Principal


Ref. No.: KSRIET/ SERB SURE Project Proposal/ MECH/ 2022-2023/03

Date: 19.09.2022

Endorsement from the Head of the Institution of PI

This is to certify that:

1. Institute welcomes participation of Name: **Dr.P.Gopinath** Designation: **Associate Professor** as the Principal Investigator and **Dr.P.Kanakarajan, Dr.M.Sivakumar** as the Co-Investigator/s for the project titled **Experimental Investigation on Joining various Alloy Materials using Friction Stir Welding** and that in the unforeseen event of discontinuance by the Principal Investigator, the Co-Investigator will assume the responsibility of the fruitful completion of the project with the approval of SERB.
2. The PI, **Dr.P.Gopinath** is a permanent or regular employee of this Institute/University/Organization and has 16 years of regular service left before superannuation.
3. The project starts from the date on which the University/Institute/ Organization/College receives the grant from SCIENCE & ENGINEERING RESEARCH BOARD (SERB), New Delhi.
4. The investigator will be governed by the rules and regulations of University/Institute/Organization/College and will be under administrative control of the University/Institute/Organization/College for the duration of the project.
5. The grant-in-aid by the SCIENCE & ENGINEERING RESEARCH BOARD (SERB), New Delhi will be used to meet the expenditure on the project and for the period for which the project has been sanctioned as mentioned in the sanction order.
6. No administrative or other liability will be attached to SCIENCE & ENGINEERING RESEARCH BOARD (SERB), New Delhi at the end of the project.
7. The University/Institute/Organization/College will provide basic infrastructure and other required facilities to the investigator for undertaking the research project.
8. The University/ Institute/Organization/College will take into its books all assets created in the above project and its disposal would be at the discretion of SCIENCE & ENGINEERING RESEARCH BOARD (SERB), New Delhi.
9. The University/Institute/Organization/College assumes to undertake the financial and other management responsibilities of the project.


Signature of Head of the Institute
Dr. M. VENKATESAN, M.E., Ph.D.,
PRINCIPAL,
K S R INSTITUTE FOR
ENGINEERING AND TECHNOLOGY,
K.S.R. KALVI NAGAR,
TIRUCHENGODE-637 215,
NAMAKKAL DI, TAMIL NADU.

Undertaking by the Principal Investigator

To

The Secretary
SERB,
New Delhi

Sir

I **Dr. P.GOPINATH, Associate Professor, Department of Mechanical Engineering**, here by certify that the research proposal titled **Experimental Investigation on Joining various Alloy Materials using Friction Stir Welding** submitted for possible funding by SERB, New Delhi is my original idea and has not been copied/taken verbatim from anyone or from any other sources. I further certify that this proposal has been checked for plagiarism through a plagiarism detection tool i.e. **Urkund** approved by the Institute and the contents are original and not copied/taken from any one or many other sources. I am aware of the UGC's Regulations on prevention of Plagiarism i.e. University Grant Commission (Promotion of Academic Integrity and Prevention of Plagiarism in Higher Educational Institutions) Regulation, 2018. I also declare that there are no plagiarism charges established or pending against me in the last five years. If the funding agency notices any plagiarism or any other discrepancies in the above proposal of mine, I would abide by what so ever action taken against me by SERB, as deemed necessary.


Signature of PI with date

Dr.P.GOPINATH
Associate Professor



Project Proposal On

"Hybrid Energy Storage Systems for Renewable Energy"

Submitted to

Division :Technology Mission Division

Programme or Scheme : Advanced Materials and Energy Storage
Technology (AMEST)

Submitted by

Project Investigator:

Dr. P Gopinath

K S R INSTITUTE FOR ENGINEERING AND TECHNOLOGY-
Namakkal

General Information:

1. Name of the Institute/University/Organisation submitting the Project Proposal :

K S R INSTITUTE FOR
ENGINEERING AND
TECHNOLOGY

2. State : Tamilnadu

3. Principal Investigator Name: Dr. P Gopinath

4. Category: OBC

5. Type of the Institute : Academic Institutions (Private)

6. Project Title : Hybrid Energy Storage Systems for Renewable Energy

7. Division : Technology Mission Division

8. Programme Or Scheme : Advanced Materials and Energy Storage Technology (AMEST)

9. Academic Area : Mechanical Engineering,

10. Application Area : Energy,

11. Government National Initiative : Make in India, Startup India, Innovate India,

12. Type of Proposal : Proposal Against Call

13. Project Duration : 3 Years and 0 Months

14. Proposal Submit Date : 30/09/2022

15. Project Keywords : Solar, Battery storage, Renewable Energy, hybrid flow battery

16. Project Summary :

Project Title Hybrid Energy Storage Systems for Renewable Energy

Name of Prototype/Device proposed to develop Mobility services including storage options a range of mobilityrelated services based on the use of Electric Vehicleswill be developed in the region.

Technology Readiness Level TRL

TRL 1Regulator Readiness Level

RRL RRL 1 Market Readiness Level

MRL MRL 1

Use of proposed device and Potential User One lineElectric Vehicles and People

PI NameDr.P.GopinathAge46

Contact No. Mobile Office Email IDAssociate Professor, Department of Mechanical Engineering, KSR Institute ForEngineering and Technology, Tiruchengode, Namakkal -637215, Mobile Number 9500998458

Contact No. Office 04288 – 274773, E-Mail gopipalaniksriet.ac.in

Co- PI'sDr.P.KanakarajanAge54

Contact No. Mobile Office Email IDAssociate Professor, Department of Mechanical Engineering, KSR Institute ForEngineering and Technology, Tiruchengode, Namakkal -637215, Mobile Number 9842555119

Contact No. Office 04288 – 274773, E-Mailkanagu.dhanaksriet.ac.in

Co- PI'sDr.M.SivakumarAge46

Contact No. Mobile Office Email IDAssociate Professor, Department of Mechanical Engineering, KSR Institute ForEngineering and Technology, Tiruchengode, Namakkal -637215, Mobile Number 9944651425

Contact No. Office 04288 – 274773, E-Mail kpmshivaksriet.ac.in

Total Cost 1CroreDuration 3 yearsManpower02

Equipment proposed 2kW Solar Panel with Battery

Industry Partner if any

Industry' financial Contribution if any

Objectives

iSolar and battery microgrids, providing electrification

iiIntegration of large scale distributed solar and storage into an existing diesel generationbased network

Methodology in brief 150 words

The methodology used in conducting this review is adapted from a standard project post implementationreview andapplied across a portfolio of projects. The authors led the review, relying on the core project deliveryteam and key stakeholder representatives as the subject matter experts. Interviews were conducted with thesestakeholders to understand and evaluate project performance and key issues or concerns.

This methodology resulted in identification of three principal areas of challenge for the projects

• Technical challenges

Maturing BESS industry

Improving alignment between technical considerations and decision-making

• Standards, safety and environmental challenges

• Procurement challenges

There are significant knowledge gaps for stakeholders about the associated technical issues, particularlywith medium to high renewable energy hybrid systems, BESS, technology selection, and control systemsrequirements.Technical assistance consultants cannot always understand or address the driversand needs of stakeholders.

These factors contribute to reduced accuracy of risk assessments andsub- optimal decision-making, which can beaddressed through a consolidated program to build andmaintain local energy literacy, supported by tools and information designed to communicate keyconcepts clearly.

Technology has matured substantially since the case study projects commenced. It is now apparentthat BESS can offer a full suite of grid support functions allowing stable operation of small, mediumand large isolated networks withhigh renewable contribution, even without synchronous dieselgeneration online.

However, there is still significant progress to be made, and particular gaps remain inthese areas

a product standardization,

b end-of-life treatment, including replacement,

c Clarity on emergency services response requirements, and

d Consistency in definitions of control capabilities and in diesel-off operational capability

ii For future projects, it is critical to understand these gaps. Noting that BESS products are not yet highlystandardized, specifies must give detailed consideration to the required project-specific functionalityand operating environment and specify or select applicable standards or requirements accordingly.

iii It is also recommended to monitor on-going technology advancement, including standards, and applycontinuous improvement to technical specifications and concept development.

Deliverables

Most importantly, hybrid solution that combines more than one technology to meet the demands is also

Budget

Details

| Sr. No. | Items | Budget in Lakhs | 1st Year | 2nd Year | 3rd Year | Total |
|---------|----------------------|------------------|------------------|------------------|------------------|------------------|
| 1. | Equipment's | 6,00,000 | 6,00,000 | 6,00,000 | 6,00,000 | 18,00,000 |
| 2. | Salaries/Fellowships | | | | | |
| | Name | No. | 4,80,000 | 4,80,000 | 4,80,000 | 14,40,000 |
| 3. | Consumables | 2,50,000 | 2,50,000 | 2,50,000 | 2,50,000 | 7,50,000 |
| 4. | Travel | ---- | | | | |
| 5. | Contingencies | 2,00,000 | 2,00,000 | 2,00,000 | 2,00,000 | 6,00,000 |
| 6. | Overhead Expenses | 11,50,000 | 1,50,000 | 1,50,000 | 1,50,000 | 14,50,000 |
| | Total | 26,80,000 | 16,80,000 | 16,80,000 | 16,80,000 | 60,40,000 |

Any other relevant information including Novelty /Details of Proof of Concept/Prototype developed by Investigator/Team - maximum 150 words

Flow batteries are another type of electrochemical energy storage devices playing a role in stationary energy storage applications. Polysulphide bromine PSB, Vanadium redox VRFB, and Zinc bromine Zn Br redox flow batteries are among the types of flow batteries utilized as stationary energy storage devices.

The technical characteristics of these flow batteries are provided in terms of ranges as follows. The specific energy of flow batteries ranges from 10 to 35 Wh/kg, specific power of 100–166 W/kg, round trip efficiency of 65–85%, service life of 15 years, and self-discharge rate of ~0. With these technical features, flow batteries are considered as an advantage in stationary storage applications with low self-discharge as well as high service life and fast response characteristics.

Part 2: Particulars of Investigators

Principal Investigator:

| | |
|-----------------------|---------------------|
| 1. Name: | Dr. P Gopinath |
| Gender: | Male |
| Date of Birth: | 12/06/1976 |
| Designation : | ASSOCIATE PROFESSOR |

Department:

MECHANICAL DEPARTMENT

Institute/University:

K S R INSTITUTE FOR ENGINEERING AND
TECHNOLOGY

State:

Tamilnadu

District: Namakkal
City/Place: Namakkal
Address: K.S.R. Kalvi Nagar, Tiruchengode ,
Namakkal District, Tamilnadu, India
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Communication Email: gopipalani@ksriet.ac.in
Alternate Email: gopinath.palani@gmail.com
Mobile: 9500998458
Phone: 04288274773
Fax: 04288274773
Category: OBC

Co-Investigator:

1. Name: Dr. P KANAKARAJAN
Gender: Male
Date of Birth: 25/04/1967
Designation : ASSOCIATE PROFESSOR
Department: MECHANICAL ENGINEERING
Institute/University: K S R INSTITUTE FOR ENGINEERING AND
TECHNOLOGY
State: Tamilnadu
District: Namakkal
City/Place: TIRUCHENGODE
Address: K S R INSTITUTE FOR ENGINEERING
ANDTECHNOLOGY, K S R KALVI
NAGAR
Pin: 637215
Communication Email: kanagu.dhana@ksriet.ac.in

Alternate Email:

Mobile: 9842555119

Phone: 04288274773

Fax:

Category: OBC

2. Name: Dr. M SIVAKUMAR

Gender: Male

Date of Birth: 14/06/1976

Designation : ASSOCIATE PROFESSOR

Department: MECHANICAL ENGINEERING

Institute/University: K S R INSTITUTE FOR ENGINEERING AND TECHNOLOGY

State: Tamilnadu

District: Namakkal

City/Place: TIRUCHENGODE

Address: KSR INSTITUTE FOR ENGINEERING AND TECHNOLOGY, KSR KALVI NAGAR

Pin: 637215

Communication Email: kpmshiva@ksriet.ac.in

Alternate Email:

Mobile: 9944651425

Phone: 4288274773

Fax:

Category: OBC

1. Name: S VENKATACHALAPATHY

Mobile:

Designation : Professor
Email: svc@nitt.edu
Institute/University: NIT TIRUCHIRAPPALLI
Address: Tanjore Main Road, Thuvakudy
Academic Area: Mechanical Engineering,
Application Area: Energy,
State: Tamilnadu
District: Tiruchirappalli
City: Tiruchirappalli
Address: Department Of Mechanical Engineering, National Institute of Technology, Tiruchirappalli - 620015

Pin Code:

2. Name: C NANDAKUMAR
Mobile: 9842735311
Designation : ASSISTANT PROFESSOR SELECTION GRADE
Email: nandakumarc@mitindia.edu
Institute/University: ANNA UNIVERSITY, MADRAS INSTITUTE OF TECHNOLOGY CAMPUS
Address: MIT campus, Radha nagar, Chromepet
Academic Area: Material Science & Engineering,
Application Area: Energy,
State: Tamilnadu
District: Chennai
City: CHROME PET

Address:

MADRAS INSTITUTE OF
TECHNOLOGYCHROMPET,
CHENNAI - 600044

Part 4: Financial Details

Financial Details:

A. Non - Recurring

Equipment

| S. | Equipments | Qty. | Justification | 1 Year | 2 Year | 3 Year | Total |
|--------------|--------------|------|---------------|---------------|---------------|---------------|----------------|
| 1 . | Flow Battery | 1 | | 350000 | 350000 | 350000 | 1050000 |
| 2 . | Solar Panel | 1 | | 250000 | 250000 | 250000 | 750000 |
| Total | | | | 600000 | 600000 | 600000 | 1800000 |

B. Recurring

Project Staff

| S. | Project Staff | No. | Justification | 1 Year | 2 Year | 3 Year | Total |
|--------------|---------------------|-----|---------------------------|---------------|---------------|---------------|----------------|
| 1 . | Project Associate-I | 2 | Project Associate - 20000 | 480000 | 480000 | 480000 | 1440000 |
| Total | | | | 480000 | 480000 | 480000 | 1440000 |

Consumables

| S. | Items | Qty. | Justification | 1 Year | 2 Year | 3 Year | Total |
|--------------|--------|------|--|---------------|---------------|---------------|---------------|
| 1 . | Cables | 500 | Cables for electric distribution purpose | 250000 | 250000 | 250000 | 750000 |
| Total | | | | 250000 | 250000 | 250000 | 750000 |

Contingency

| S. | Description | Justification | 1 Year | 2 Year | 3 Year | Total |
|--------------|-------------|---------------------|---------------|---------------|---------------|---------------|
| 1 . | Contingency | Unexpected expenses | 200000 | 200000 | 200000 | 600000 |
| Total | | | 200000 | 200000 | 200000 | 600000 |

Overhead

| S. | Description | Justification | 1 Year | 2 Year | 3 Year | Total |
|--------------|-------------------|------------------------|----------------|---------------|---------------|----------------|
| 1 . | Overhead Expenses | Institutional Expenses | 1150000 | 0 | 0 | 1150000 |
| 2 . | Overhead expenses | Institutional Overhead | 0 | 150000 | 150000 | 300000 |
| Total | | | 1150000 | 150000 | 150000 | 1450000 |

Budget Head Summary in (INR)

| Budget Head | Year-1 | Year-2 | Year-3 | Total |
|-------------------------|--------|--------|--------|----------------|
| 1- Non-Recurring | | | | |
| Equipment | 600000 | 600000 | 600000 | 1800000 |
| Subtotal (Capital) | 600000 | 600000 | 600000 | 1800000 |
| 2- Recurring | | | | |
| Project Staff | 480000 | 480000 | 480000 | 1440000 |
| Consumables | 250000 | 250000 | 250000 | 750000 |
| Contingency | 200000 | 200000 | 200000 | 600000 |

| | | | | |
|--------------------|---------|---------|---------|----------------|
| Overhead | 1150000 | 150000 | 150000 | 1450000 |
| Subtotal (General) | 2080000 | 1080000 | 1080000 | 4240000 |

| | | | | |
|--|---------|---------|---------|---------|
| Total Project Cost (Capital + General) | 2680000 | 1680000 | 1680000 | 6040000 |
|--|---------|---------|---------|---------|

Part 5: PFMS Details

PFMS Unique Code Available: No

Type of Registration : Academic Institutions (Private)

PAN Number : AAATA2605F

Agency Name : AARTHI EDUCATIONAL AND CHARITABLE TRUST

Act Registration No. : 386 OF 1996

Registering Authority : Sub-Registrar

TIN Number : NA

TAN Number : NA

GST Number : NA

Block No /Building /Village /Name of Premises : K S R INSTITUTE FOR ENGINEERING AND TECHNOLOGY

Road/Street/Post Office : K S R KALVI NAGAR

Area/Loacality : TIRUCHENGODE

City : NAMAKKAL

Pin Code : 637215

State : Tamilnadu

District : Namakkal

Contact Person : Dr M VENKATESAN

Designation : PRINCIPAL

Phone Number : 04288274773

Mobile Number : 9944456056

Email ID : principal@ksriet.ac.in

Bank Name : LAKSHMI VILLAS BANK

Branch Address of the Bank :

KSR EDUCATIONAL INSTITUTION (KSREI) CAMPUS,
ERODE MAIN ROAD, THOKKAVADI, TIRUCHENGODE

Bank Branch Name :

THOKKAVADI

Bank Account Number of the Beneficiary :

0751301000154073

IFSC Code of the bank :

DBSS0IN0751

MICR Code of the bank :

638056014

Part 6: Current Ongoing Project

Current Ongoing Project: NA

List of Uploaded Documents:-

1. Complete Project proposal
2. Biodata
3. Certificate from PI
4. Conflict of interest
5. Endorsement from head of Institute
6. Quotation for Equipments

FORMAT FOR SUBMISSION OF PROJECT PROPOSALS

PART-A

1. **PROJECTTITLE:** Hybrid Energy storage Systems for Renewable Energy
2. **BROAD AREA:** Mechanical Energy
3. **TOTAL COST OF THE PROJECT:** 60,40,000
4. **PROJECT DURATION:** 3 Years
5. **INSTITUTION/ORGANIZATION:** K S R Institute For Engineering and Technology, Tiruchengode - 637215

6. *PRINCIPAL INVESTIGATOR:*

Name: Dr. P.Gopinath

Designation: Associate Professor

Institution: K S R Institute for Engineering and Technology

Address: K S R Kalvi Nagar, Tiruchengode, Namakkal - 637215

Email: gopipalani@ksriet.ac.in

Mobile: 9500998458

7. *OTHER INVESTIGATOR(S)*

- i. Name : Dr. P.Kanakarajan

Designation: Associate Professor

Institution: K S R Institute for Engineering and Technology

Address: K S R Kalvi Nagar, Tiruchengode, Namakkal - 637215

Email: kanagu.dhana@ksriet.ac.in

Mobile: 9842555119

ii. Name : Dr. M. Sivakumar

Designation: Associate Professor

Institution: K S R Institute for Engineering and Technology

Address: K S R Kalvi Nagar, Tiruchengode, Namakkal - 637215

Email: kpmshiva@ksriet.ac.in

Mobile: 9944651425

PART-B

1. OBJECTIVES OF THE PROJECT:

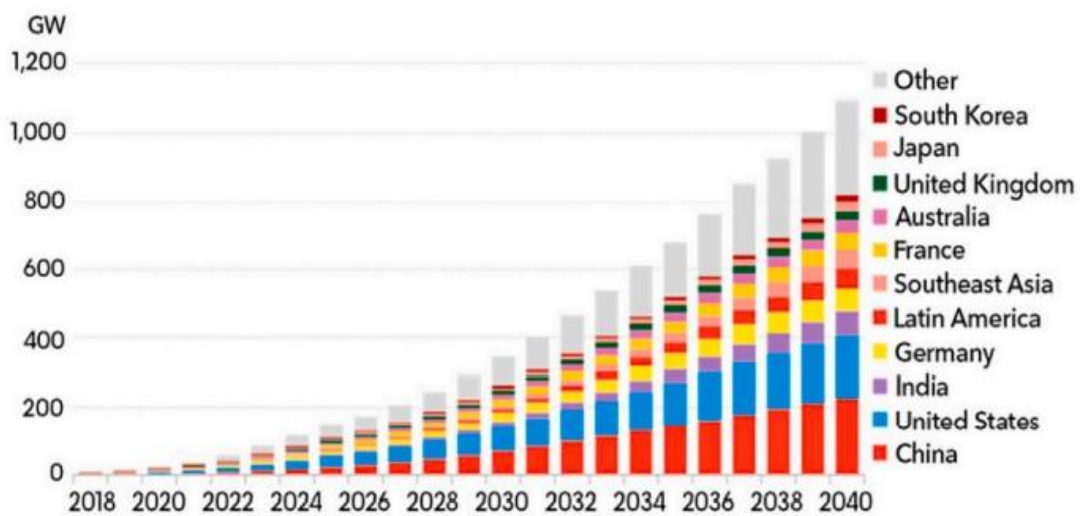
- (i) Solar and battery microgrids, providing electrification
- (ii) Integration of large scale distributed solar and storage into an existing diesel generation based network

2. REVIEW OF STATUS AND TECHNOLOGY TRENDS IN RESPECT OF MATERIAL/PROTOTYPE/DEVICETOBE TAKENUP FOR DEVELOPMENT:

a) International status of development.

Figure 1 shows the forecast of global cumulative energy storage installations in various countries which illustrates that the need for energy storage devices (ESDs) is dramatically increasing with the increase of renewable energy sources. ESDs can be used for stationary applications in every level of the network such as generation, transmission and distribution as well as local industrial and commercial customers. Nowadays, in addition to the utilization of existing ESDs in stationary applications, there is an increased motivation in the use of future advanced ESDs (Future Li-ion, solid-state batteries, Lithium-Polymer, Lithium-Sulphur batteries, and Lithium-Metal-Polymer, Metal-ion Batteries, Organic radical batteries, Hybrid Super capacitors and others.

Global cumulative energy storage installations



Source: BloombergNEF

Figure 1 Prediction of global energy storage installation by 2040

b) Time schedule of activities:

Please give bar chart indicating important activities and time duration from start to end:

Total project duration: 36 months.

The research activity related to hybrid energy storage systems are investigated. Then, review the collection of data about the project and analysis the details. The process of analysis the HESS related data take around two months. Based on the investigate results, the equipment and raw materials are purchased from the market and erection process takes place in two months. The HESS as per requirement and testing the after the erection process. The findings are validated.

| Activity | Months | | | | | | | | | | | |
|--|--------|---|---|---|---|---|---|----|----|----|----|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 9 | 12 | 18 | 24 | 30 | 36 |
| Investigate Needs | █ | | | | | | | | | | | |
| Review the investigate details | █ | █ | | | | | | | | | | |
| Analysis the collected data | | █ | █ | █ | | | | | | | | |
| Mobilization of Equipment & Raw material | | | | █ | | █ | | | | | | |
| Testing & Evaluation | | | | █ | | █ | | | | | | |
| Results and discussion | | | | | █ | | | | | | | |
| Validated the Findings | | | | | | | █ | █ | █ | █ | █ | █ |

| | | | | | | |
|---|--|-------|-----|------------|----------------|----------------|
| | | | | | | |
| 3 | Solar battery 165Ah, 36months warranty c10 Tall tubular UTL make | 4.00 | NOS | ₹13,119.00 | ₹3,148.56 (6%) | ₹3,148.56 (6%) |
| 4 | Mounting structure Jsw 275gsm GI | 1.00 | PCS | ₹24,000.00 | ₹2,160.00 (9%) | ₹2,160.00 (9%) |
| 5 | Array junction box 3in 1out | 1.00 | NOS | ₹4,000.00 | ₹360.00 (9%) | ₹360.00 (9%) |
| 6 | Solar DC cable 4 sqmm polycab or schecheim | 30.00 | MTR | ₹45.00 | ₹121.50 (9%) | ₹121.50 (9%) |
| 7 | Flexible Copper cable 10sqmm 1core Any one Reputed brand | 30.00 | MTR | ₹65.00 | ₹175.50 (9%) | ₹175.50 (9%) |
| 8 | Mc4 connector Elmex or ningbu make | 4.00 | PRS | ₹46.00 | ₹11.04 (6%) | ₹11.04 (6%) |
| 9 | Earth rod with chemical 1m Excel make copper bonded 1m | 1.00 | NOS | ₹600.00 | ₹54.00 (9%) | ₹54.00 (9%) |

| | | | | | | |
|---|---|--------|-----|------------------------------|--------------|--------------|
| 10 | Earthing conductor 50sqmm AL single strand conductor excel make | 15.00 | MTR | ₹105.00 | ₹141.75 (9%) | ₹141.75 (9%) |
| 11 | installation and commissioning | 1.00 | NOS | ₹10,000.00 | ₹900.00 (9%) | ₹900.00 (9%) |
| Total | | 103.00 | | | ₹18,853.41 | ₹18,853.41 |
| Total Amount (in words) : INR Three Lakh Thirty Thousand One Hundred Ninety TwoRupees Eighty Two Paise Only | | | | Taxable Amount CGST Value | | |
| Notes | | | | SGST Value | | |

Number of workshops/seminars conducted on Intellectual Property Rights (IPR) and Industry-Academia Innovative practices during the academic year 2022-23

| S.No | Name of the Workshop/ Seminar | Date |
|------|---|------------|
| 1. | Accelerating Innovation and creativity | 26.08.2022 |
| 2. | Intellectual Property Rights, Patent and Design Process | 18.09.2022 |
| 3. | Intellectual Property Rights (IPR) and It's Insight | 19.11.2022 |
| 4. | Seminar on "How to file a patent application" | 23.11.2022 |
| 5. | Seminar on "Patent Filing, Technology Transfer and Commercialization" | 25.11.2022 |
| 6. | Innovation Development & Technology Transfer | 10.03.2023 |
| 7. | Popular Research Zones in Electrical Sector | 10.09.2022 |
| 8. | Entrepreneurial Opportunities in Digital Marketing | 25.09.2022 |
| 9. | Research Opportunities & Higher Education Prospector | 23.10.2022 |
| 10. | Workshop on "How to do research in Collaborative Coding Using Github" | 12.11.2022 |
| 11. | Workshop on Research Perspectives on Deep Learning Techniques in image processing | 19.11.2022 |
| 12. | Insight into Research publications | 18.04.2023 |
| 13. | Research Prospects and Scope in waste to Energy Conversion | 14.03.2023 |
| 14. | Seminar on Entrepreneurship and Behavioral Skill Development | 27.10.2022 |
| 15. | Entrepreneurship-cum-Skill Development Programme | 29.10.2022 |
| 16. | Seminar on "How to plan for startup & legal ethical steps" | 22.02.2023 |
| 17. | Workshop on Entrepreneurship Skill Development and Behavioral Skill | 06.01.2022 |
| 18. | Role of Entrepreneurs in Socio-Economic Development | 18.03.2023 |
| 19. | Ten Steps to Become Entrepreneur (Seminar) | 24.09.2022 |
| 20. | Launch of 5g Services (Seminar) | 01.10.2022 |

| | | |
|-----|--|------------|
| 21. | Session on Problem Solving And Ideation Workshop (Seminar) | 20.10.2022 |
| 22. | Orientation Session on IIC 5.0 & Features(Seminar) | 01.11.2023 |
| 23. | My Story - Motivational Session By Successful Innovators(Seminar) | 13.11.2022 |
| 24. | My Story - Motivational Session By Successful Entrepreneur/Start-Up Founder. (Seminar) | 15.11.2022 |
| 25. | Session on How to Make a Problem Survey for Setting Up a Startup (Seminar) | 18.11.2022 |
| 26. | Session on Intellectual Property Rights (IPR) And It's Insights (Seminar) | 19.11.2022 |
| 27. | How to File a Patent Application | 23.11.2022 |
| 28. | Workshop on Design Thinking, Critical Thinking and Innovation Design (Workshop) | 03.01.2023 |
| 29. | Workshop on Entrepreneurship Skill, Attitude and Behavior Development(Seminar) | 10.01.2023 |
| 30. | Session on Achieving Problem-Solution Fit & Product-Market Fit (Seminar) | 19.01.2023 |
| 31. | Leadership Talk with Prof. T. G. Sitharam, Hon'ble Chairman, AICTE (Seminar) | 30.01.2023 |
| 32. | Session on Converting an Innovative Idea into a Concept(Seminar) | 05.02.2023 |
| 33. | Field/Exposure Visit to Pre-Incubation Units Such Asideas Lab, Fab Lab, Makers Space, Design Centres, City Msme Clusters, Workshops Etc. | 06.03.2023 |
| 34. | Expert Talk on Process of "Innovation Development & Technology Transfer"(Seminar) | 10.03.2023 |



MOE'S INNOVATION CELL
INSTITUTION'S INNOVATION COUNCIL

KSR INSTITUTE FOR ENGINEERING AND TECHNOLOGY
TEN STEPS TO BECOME ENTREPRENEUR

OVERVIEW

| | |
|---|---|
| Objective: | Benefit in terms of learning/Skill/Knowledge obtained: |
| Start-ups are founded by one or more entrepreneurs who want to develop a product or service | students understand When they own a business, they are their own boss |
| Academic Year: | Program driven by: |
| 2022-23 | Self-driven Activity |
| Month: | Program /Activity Name: |
| September | Ten Steps to Become Entrepreneur |
| Program Type: | Other: |
| Level 2 - Seminar | null |
| Program Theme: | Other: |
| Entrepreneurship & Startup | NA |
| Date & Duration (Days): | External Participants, If any: |
| 09/24/2022-09/24/2022-0 | 14 |
| Student Participants: | Faculty Participants: |
| | |

PRINCIPAL,
K S R INSTITUTE FOR
ENGINEERING AND TECHNOLOGY,
K S R KALVI NAGAR,
TIRUCHENGODE-637 215,
NAMAKKAL DI, TAMIL NADU

106

12

Expenditure Amount, If any:

Remark:

3000

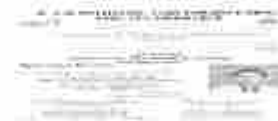
null

ATTACHMENTS

Video:

null

Photograph1:



Photograph2:

/uploads/institutes/monthlyReport/Photograph2/5578-IC201912199.jpg

Session plan, If any:

<https://api.mic.gov.in/uploads/institutes/monthlyReport/report/5803-IC201912199.pdf>

This report is electronically generated against report submitted on Institution's Innovation Council Portal.

PRINCIPAL,
K. S. R. INSTITUTE FOR
ENGINEERING AND TECHNOLOGY,
K. S. R. KALVINAGAR,
TIRUCHENGODE-637 215,
NAMAKKAL DL, TAMIL NADU.



MoE's
INNOVATION CELL
(GOVERNMENT OF INDIA)



INSTITUTION'S
INNOVATION
COUNCIL
(Ministry of Education, Government of India)

MOE'S INNOVATION CELL
INSTITUTION'S INNOVATION COUNCIL

KSR INSTITUTE FOR ENGINEERING AND TECHNOLOGY
LAUNCH OF 5G SERVICES

OVERVIEW

| Objective: | Benefit in terms of learning/Skill/Knowledge obtained: |
|--|--|
| To create awareness on launch of 5G services | 5G technology will provide seamless coverage, high data rate, low latency, and highly reliable communications. It will increase energy efficiency. |
| Academic Year: | Program driven by: |
| 2022-23 | MIC driven Activity |
| Month: | Program /Activity Name: |
| October | Launch of 5G services |
| Program Type: | Other: |
| Level 1 - Expert Talk | null |
| Program Theme: | Other: |
| IPR & Technology Transfer | NA |
| Date & Duration (Days): | External Participants, If any: |
| 10/01/2022-10/01/2022-0 | null |

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K S R KALVI NAGAR,
TIRUCHENGODE-637 015,
NASSARUDDIN SALI ROAD

Student Participants:

113

Faculty Participants:

30

Expenditure Amount, If any:

null

Remark:

null

ATTACHMENTS

Video:

null

Photograph1:



Photograph2:

/uploads/institutes/monthlyReport/Photograph2/1745-IC201912199.jpeg

Session plan, If any:

<https://api.mic.gov.in/uploads/institutes/monthlyReport/report/3557-IC201912199.pdf>

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K S K KALVI NAGAR,
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MoE's
INNOVATION CELL
(GOVERNMENT OF INDIA)



INSTITUTION'S
INNOVATION
COUNCIL
University of Education, Madurai

MOE'S INNOVATION CELL
INSTITUTION'S INNOVATION COUNCIL

KSR INSTITUTE FOR ENGINEERING AND TECHNOLOGY
SESSION ON PROBLEM SOLVING AND IDEATION WORKSHOP

OVERVIEW

| Objective: | Benefit in terms of learning/Skill/Knowledge obtained: |
|--|--|
| the importance of innovation and idea generation to develop them out of the box thinking | students learnt about ideation and suggest as many ideas as possible based on their diverse knowledge. |
| Academic Year: | Program driven by: |
| 2022-23 | IC Calendar Activity |
| Month: | Program /Activity Name: |
| November | Session on Problem Solving and Ideation Workshop |
| Program Type: | Other: |
| Level 2 - Workshop | NA |
| Program Theme: | Other: |
| Innovation & Design Thinking | NA |
| Date & Duration (Days): | External Participants, If any: |
| 10/20/2022-10/20/2022-0 | null |

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K S R, KALVI NAGAR,
TIRUCHENGODE-637 215,
NAMAKKAL DI, TAMIL NADU,

Student Participants:

140

Faculty Participants:

40

Expenditure Amount, If any:

null

Remark:

NA

ATTACHMENTS

Video:

NA

Photograph1:



Photograph2:

NA

Session plan, If any:

<https://api.mic.gov.in/uploads/institutes/monthlyReport/report/7658-IC201912199.pdf>

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KSR INSTITUTE FOR ENGINEERING AND TECHNOLOGY
ORIENTATION SESSION ON IIC 5.0 & AMP; FEATURES

OVERVIEW

| Objective: | Benefit in terms of learning/Skill/Knowledge obtained: |
|---|---|
| Awareness on New Features of IIC 5.0 Portal | Learned all new features in IIC 5.0 |
| Academic Year: | Program driven by: |
| 2022-23 | MIC driven Activity |
| Month: | Program /Activity Name: |
| January | Orientation Session on IIC 5.0 & Features |
| Program Type: | Other: |
| Level 1 - Expert Talk | null |
| Program Theme: | Other: |
| IPR & Technology Transfer | NA |
| Date & Duration (Days): | External Participants, If any: |
| 01/11/2023-01/11/2023-0 | null |
| Student Participants: | Faculty Participants: |
| 124 | 51 |

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TIRUCHENGODE-637 215,
NAMAKKAL DL. TAMIL NADU.

Expenditure Amount, If any:

null

Remark:

null

ATTACHMENTS

Video:

null

Photograph1:



Photograph2:

/uploads/institutes/monthlyReport/Photograph2/6280-IC201912199.jpg

Session plan, If any:

<https://api.mic.gov.in/uploads/institutes/monthlyReport/report/6954-IC201912199.pdf>

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KSR INSTITUTE FOR ENGINEERING AND TECHNOLOGY
MY STORY - MOTIVATIONAL SESSION BY SUCCESSFUL INNOVATORS.

OVERVIEW

| | |
|---|--|
| Objective: | Benefit in terms of learning/Skill/Knowledge obtained: |
| Innovation to increase their market share and profit margin | well-guided innovation process. Gartner recommends framing your goals using the SMART approach |
| Academic Year: | Program driven by: |
| 2022-23 | IIC Calendar Activity |
| Month: | Program /Activity Name: |
| November | My Story - Motivational Session by Successful Innovators. |
| Program Type: | Other: |
| Level 1 - Expert Talk | NA |
| Program Theme: | Other: |
| Innovation & Design Thinking | NA |
| Date & Duration (Days): | External Participants, If any: |
| 11/13/2022-11/13/2022-0 | null |

Student Participants:

113

Faculty Participants:

30

Expenditure Amount, If any:

null

Remark:

NA

ATTACHMENTS

Video:

NA

Photograph1:



Photograph2:

/uploads/institutes/monthlyReport/Photograph2/3107-IC201912199.jpg

Session plan, If any:

<https://api.mic.gov.in/uploads/institutes/monthlyReport/report/3058-IC201912199.pdf>

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NAMAKKAL DISTRICT, TAMIL NADU.



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INSTITUTION'S
INNOVATION
COUNCIL
(Ministry of Education, Government of India)

MOE'S INNOVATION CELL
INSTITUTION'S INNOVATION COUNCIL

KSR INSTITUTE FOR ENGINEERING AND TECHNOLOGY
MY STORY - MOTIVATIONAL SESSION BY SUCCESSFUL ENTREPRENEUR/START-UP FOUNDER.

OVERVIEW

Objective:

START UP Talk is one of the forum activity comes under start-up refers to a company in the first sta

Benefit in terms of learning/Skill/Knowledge obtained:

The main outcome of the program is to create the When you own a business, you are your own boss. This means that you decide your schedule, call the sh

Academic Year:

2022-23

Program driven by:

IIC Calendar Activity

Month:

November

Program /Activity Name:

My Story - Motivational Session by Successful Entrepreneur/Start-up founder.

Program Type:

Level 2 - Seminar

Other:

null

Program Theme:

Entrepreneurship & Startup

Other:

NA

Date & Duration (Days):

External Participants, If any:

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TIRUCHENGODE-637 215,
NAMAKKAL DI, TAMIL NADU.

11/15/2022-11/15/2022-0

null

Student Participants:

Faculty Participants:

100

35

Expenditure Amount, If any:

Remark:

null

null

ATTACHMENTS

Video:

null

Photograph1:



Photograph2:

/uploads/institutes/monthlyReport/Photograph2/2879-IC201912199.jpg

Session plan, If any:

<https://api.mic.gov.in/uploads/institutes/monthlyReport/report/8419-IC201912199.pdf>

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KSR INSTITUTE FOR ENGINEERING AND TECHNOLOGY
SESSION ON HOW TO MAKE A PROBLEM SURVEY FOR SETTING UP A STARTUP

OVERVIEW

| | |
|---|---|
| Objective: | Benefit in terms of learning/Skill/Knowledge obtained: |
| Follow the specific, measurable, achievable, relevant, and time-bound (SMART) rule. | Surveys allow businesses across all industries to efficiently collect honest feedback, opinions and responses from customers and employees. |
| Academic Year: | Program driven by: |
| 2022-23 | Self-driven Activity |
| Month: | Program /Activity Name: |
| November | Session on How to make a Problem Survey for setting up a Startup |
| Program Type: | Other: |
| Level I - Expert Talk | NA |
| Program Theme: | Other: |
| Entrepreneurship & Startup | NA |
| Date & Duration (Days): | External Participants, If any: |
| 11/18/2022-11/18/2022-0 | null |

Student Participants:

164

Faculty Participants:

30

Expenditure Amount, If any:

null

Remark:

NA

ATTACHMENTS

Video:

NA

Photograph1:



Photograph2:

/uploads/institutes/monthlyReport/Photograph2/9446-IC201912199.jpg

Session plan, If any:

<https://api.mic.gov.in/uploads/institutes/monthlyReport/report/7031-IC201912199.pdf>

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INSTITUTION'S
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COUNCIL
Ministry of Education, Government of India

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KSR INSTITUTE FOR ENGINEERING AND TECHNOLOGY
SESSION ON INTELLECTUAL PROPERTY RIGHTS (IPR) AND IT'S INSIGHTS

OVERVIEW

| Objective: | Benefit in terms of learning/Skill/Knowledge obtained: |
|---|--|
| Aim to giving exposure about patent filling , outline about the IPR and different types of patents | Students able to know how to file a patent from their project idea, different types of patents and benefits of IPR |
| Academic Year: | Program driven by: |
| 2022-23 | Self-driven Activity |
| Month: | Program /Activity Name: |
| November | Session on Intellectual Property Rights (IPR) and it's insights |
| Program Type: | Other: |
| Level 2 - Seminar | NA |
| Program Theme: | Other: |
| IPR & Technology Transfer | NA |
| Date & Duration (Days): | External Participants, If any: |
| 11/19/2022-11/19/2022-0 | null |

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K S & KALVI NAGAR,
TIRUCHENGODE-637 215,
NAMAKKAL Dt, TAMIL NADU.

Student Participants:

141

Faculty Participants:

12

Expenditure Amount, If any:

0

Remark:

nil

ATTACHMENTS

Video:

NA

Photograph1:



Photograph2:

/uploads/institutes/monthlyReport/Photograph2/2980-IC201912199.jpeg

Session plan, If any:

<https://api.mic.gov.in/uploads/institutes/monthlyReport/report/4675-IC201912199.pdf>

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**KSR INSTITUTE FOR ENGINEERING AND TECHNOLOGY,
TIRUCHENGODE (IC201912199)**
HOW TO FILE A PATENT APPLICATION

OVERVIEW

| | |
|--|--|
| Objective: | Benefit in terms of learning/Skill/Knowledge obtained: |
| Awareness on IPR patent and its filing procedure | how IPR restricts copying others ideas and how this will help the development of new ideas for the betterment of the society |
| Academic Year: | Program driven by: |
| 2022-23 | Self-driven Activity |
| Month: | Program /Activity Name: |
| November | HOW TO FILE A PATENT APPLICATION |
| Program Type: | Other: |
| Level I - Expert Talk | null |
| Program Theme: | Other: |
| IPR & Technology Transfer | NA |
| Date & Duration (Days): | External Participants, If any: |
| 11/23/2022-11/23/2022-0 | null |

Student Participants:

176

Faculty Participants:

30

Expenditure Amount, If any:

null

Remark:

null

ATTACHMENTS

Video:

null

Photograph1:



Photograph2:

/uploads/institutes/monthlyReport/Photograph2/9547-IC201912199.jpg

Session plan, If any:

<https://api.mic.gov.in/uploads/institutes/monthlyReport/report/3414-IC201912199.pdf>

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MoE's
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(GOVERNMENT OF INDIA)



INSTITUTION'S
INNOVATION
COUNCIL
(Ministry of Education)

MOE'S INNOVATION CELL
INSTITUTION'S INNOVATION COUNCIL

KSR INSTITUTE FOR ENGINEERING AND TECHNOLOGY
WORKSHOP ON DESIGN THINKING, CRITICAL THINKING AND INNOVATION DESIGN

OVERVIEW

| Objective: | Benefit in terms of learning/Skill/Knowledge obtained: |
|--|---|
| Design thinking is a process for solving problems by prioritizing the consumer's needs | critical thinking is a method for evaluating and analyzing problems, ideas, and different situations to build a clear understanding before reaching |
| Academic Year: | Program driven by: |
| 2022-23 | IC Calendar Activity |
| Month: | Program /Activity Name: |
| February | Workshop on Design Thinking, Critical thinking and Innovation Design |
| Program Type: | Other: |
| Level 2 - Workshop | null |
| Program Theme: | Other: |
| Innovation & Design Thinking | NA |
| Date & Duration (Days): | External Participants, If any: |
| 01/03/2023-01/03/2023-0 | null |

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K S R INSTITUTE FOR
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K S R KALVI NAGAR,
TIRUCHENGODE-637 215,
NAMAKKAL DISTRICT, TAMIL NADU.

Student Participants:

113

Faculty Participants:

25

Expenditure Amount, If any:

null

Remark:

null

ATTACHMENTS

Video:

null

Photograph1:



Photograph2:

/uploads/institutes/monthlyReport/Photograph2/4525-IC201912199.jpg

Session plan, If any:

<https://api.mic.gov.in/uploads/institutes/monthlyReport/report/6814-IC201912199.pdf>

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NAMAKKAL Dt, TAMIL NADU.

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KSR INSTITUTE FOR ENGINEERING AND TECHNOLOGY
WORKSHOP ON ENTREPRENEURSHIP SKILL, ATTITUDE AND BEHAVIOR
DEVELOPMENT

OVERVIEW

| | |
|---|---|
| Objective: | Benefit in terms of learning/Skill/Knowledge obtained: |
| To spark the entrepreneurial spirit in budding innovators by guiding them | To convert their Innovative Ideas and emerge as successful Entrepreneurs. |
| Academic Year: | Program driven by: |
| 2022-23 | IIC Calendar Activity |
| Month: | Program /Activity Name: |
| February | Workshop on Entrepreneurship Skill, Attitude and Behavior Development |
| Program Type: | Other: |
| Level 2 - Workshop | NA |
| Program Theme: | Other: |
| Entrepreneurship & Startup | NA |
| Date & Duration (Days): | External Participants, If any: |
| 01/10/2023-01/10/2023-0 | null |

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K S R KALVI NAGAR,
TIRUCHENGODE-637 215,
NAMAKKAL DI, TAMIL NADU

Student Participants:

100

Faculty Participants:

54

Expenditure Amount, If any:

null

Remark:

NA

ATTACHMENTS

Video:

NA

Photograph1:



Photograph2:

/uploads/institutes/monthlyReport/Photograph2/6089-IC201912199.png

Session plan, If any:

<https://api.mic.gov.in/uploads/institutes/monthlyReport/report/9563-IC201912199.pdf>

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MoE's
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INSTITUTION'S
INNOVATION
COUNCIL
MINISTRY OF EDUCATION, GOVERNMENT OF INDIA

MOE'S INNOVATION CELL
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KSR INSTITUTE FOR ENGINEERING AND TECHNOLOGY
SESSION ON ACHIEVING PROBLEM-SOLUTION FIT & PRODUCT-MARKET FIT

OVERVIEW

| | |
|--|---|
| Objective: | Benefit in terms of learning/Skill/Knowledge obtained: |
| working towards innovation, development or commercialization of products, services, processes driven | Entrepreneur challenges faced by start-ups insufficiency of talent |
| Academic Year: | Program driven by: |
| 2022-23 | IIC Calendar Activity |
| Month: | Program /Activity Name: |
| February | Session on Achieving Problem-Solution Fit & Product-Market Fit |
| Program Type: | Other: |
| Level 2 - Seminar | null |
| Program Theme: | Other: |
| Entrepreneurship & Startup | NA |
| Date & Duration (Days): | External Participants, If any: |
| 01/19/2023-01/19/2023-0 | null |

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K S R KALVINAGAR,
TIRUCHENGODE-637 215,
NAMAKKAL DL, TAMIL NADU

Student Participants:

164

Faculty Participants:

30

Expenditure Amount, If any:

null

Remark:

null

ATTACHMENTS

Video:

null

Photograph1:



Photograph2:

/uploads/institutes/monthlyReport/Photograph2/2441-IC201912199.jpg

Session plan, If any:

<https://api.mic.gov.in/uploads/institutes/monthlyReport/report/4162-IC201912199.pdf>

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KSR INSTITUTE FOR ENGINEERING AND TECHNOLOGY
LEADERSHIP TALK WITH PROF. T. G. SITHARAM, HON'BLE CHAIRMAN, ALL INDIA
COUNCIL FOR TECHNICAL EDUCATION (AICTE)

OVERVIEW

| | |
|--|---|
| Objective: | Benefit in terms of learning/Skill/Knowledge obtained: |
| Awareness in key activities of the Institutions Innovation Council | knowledge about the activities of IIC in the forthcoming year and also the analysis of what happened in the previous year was learned |
| Academic Year: | Program driven by: |
| 2022-23 | MIC driven Activity |
| Month: | Program /Activity Name: |
| January | Leadership Talk with Prof. T. G. Sitharam, Hon'ble Chairman, All India Council for Technical Education (AICTE) |
| Program Type: | Other: |
| Level 1 - Expert Talk | null |
| Program Theme: | Other: |
| IPR & Technology Transfer | NA |
| Date & Duration (Days): | External Participants, If any: |

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NAVARANGUL DE, TAMIL NADU

01/30/2023-01/30/2023-0

null

Student Participants:

Faculty Participants:

112

25

Expenditure Amount, If any:

Remark:

null

null

ATTACHMENTS

Video:

null

Photograph1:



Photograph2:

/uploads/institutes/monthlyReport/Photograph2/8257-IC201912199.jpg

Session plan, If any:

<https://api.mic.gov.in/uploads/institutes/monthlyReport/report/4306-IC201912199.pdf>

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MoE's
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(GOVERNMENT OF INDIA)



INSTITUTION'S
INNOVATION
COUNCIL
(Ministry of Education)

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INSTITUTION'S INNOVATION COUNCIL**

**KSR INSTITUTE FOR ENGINEERING AND TECHNOLOGY
SESSION ON CONVERTING AN INNOVATIVE IDEA INTO A CONCEPT**

OVERVIEW

| | |
|---|--|
| Objective: | Benefit in terms of learning/Skill/Knowledge obtained: |
| Innovation of any new product with the right intent clarifies | The idea to impact for an entrepreneur is a lonely path to walk on |
| Academic Year: | Program driven by: |
| 2022-23 | Self-driven Activity |
| Month: | Program /Activity Name: |
| February | Session on Converting an Innovative Idea into a Concept |
| Program Type: | Other: |
| Level 1 - Expert Talk | null |
| Program Theme: | Other: |
| Innovation & Design Thinking | NA |
| Date & Duration (Days): | External Participants, If any: |
| 02/05/2023-02/05/2023-0 | null |
| Student Participants: | Faculty Participants: |
| | |

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NANDYALUR DISTRICT, TAMIL NADU.

100

35

Expenditure Amount, If any:

Remark:

null

null

ATTACHMENTS

Video:

null

Photograph1:



Photograph2:

/uploads/institutes/monthlyReport/Photograph2/1740-IC201912199.jpg

Session plan, If any:

<https://api.mic.gov.in/uploads/institutes/monthlyReport/report/8314-IC201912199.pdf>

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INSTITUTION'S
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Supporting Innovation in Education

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KSR INSTITUTE FOR ENGINEERING AND TECHNOLOGY

FIELD/EXPOSURE VISIT TO PRE-INCUBATION UNITS SUCH AS IDEAS LAB, FAB LAB, MAKERS SPACE, DESIGN CENTRES, CITY MSME CLUSTERS, WORKSHOPS ETC.

OVERVIEW

| | |
|--|--|
| Objective: | Benefit in terms of learning/Skill/Knowledge obtained: |
| Industry interaction is also helpful in updating the curriculum when there are significant changes | This practical learning experience is necessary for students who have to date studied theory only and are unaware of a real production plant's daily |
| Academic Year: | Program driven by: |
| 2022-23 | IIC Calendar Activity |
| Month: | Program /Activity Name: |
| February | Field/Exposure Visit to Pre-incubation units such as Ideas Lab, Fab lab, Makers Space, Design Centres, City MSME clusters, workshops etc. |
| Program Type: | Other: |
| Level 2 - Exposure Visit | null |
| Program Theme: | Other: |
| IPR & Technology Transfer | NA |
| Date & Duration (Days): | External Participants, If any: |

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03/06/2023-03/06/2023-0

null

Student Participants:

Faculty Participants:

119

7

Expenditure Amount, If any:

Remark:

null

null

ATTACHMENTS

Video:

null

Photograph1:



Photograph2:

/uploads/institutes/monthlyReport/Photograph2/1528-IC201912199.jpg

Session plan, If any:

<https://api.mic.gov.in/uploads/institutes/monthlyReport/report/8147-IC201912199.pdf>

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K S R KALVI NAGAR,
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NAMAKKAL Dt, Tamil Nadu.

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KSR INSTITUTE FOR ENGINEERING AND TECHNOLOGY
EXPERT TALK ON PROCESS OF "INNOVATION DEVELOPMENT & TECHNOLOGY TRANSFER"

OVERVIEW

| | |
|---|---|
| Objective: | Benefit in terms of learning/Skill/Knowledge obtained: |
| Explained about skill required for career growth in electrical field in IT sector | Gave guidelines to the students to upgrade their skill towards their job opportunities. ? Understood the opportunities for Electrical Engineers in IT |
| Academic Year: | Program driven by: |
| 2022-23 | Self-driven Activity |
| Month: | Program /Activity Name: |
| March | Expert Talk on Process of "Innovation Development & Technology Transfer" |
| Program Type: | Other: |
| Level I - Expert Talk | null |
| Program Theme: | Other: |
| Innovation & Design Thinking | NA |
| Date & Duration (Days): | External Participants, If any: |
| 03/10/2023-03/10/2023-0 | 0 |

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NAMAKKAL Dt. TAMIL NADU.

Student Participants:

100

Faculty Participants:

12

Expenditure Amount, If any:

0

Remark:

NIL

ATTACHMENTS

Video:

null

Photograph1:



Photograph2:

/uploads/institutes/monthlyReport/Photograph2/3090-IC201912199.jpeg

Session plan, If any:

<https://api.mic.gov.in/uploads/institutes/monthlyReport/report/3637-IC201912199.pdf>

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