Temporary Registration No. : TPN / 94459

सत्यमेव जयते
Ministry of Science & Technology
Government of India

Project Proposal On

"Empowering students for Monitoring their well-being in health, cleanliness with IoT techniques."

Submitted to

Division :NCSTC

Programme or Scheme : NATIONAL CHILDRENS SCIENCE CONGRESS AND INITIATIVES FOR CHILD SCIENTSTS RESEARCH AND INNOVATIONS

Submitted by

Project Investigator:

Dr. P JOEL JOSEPHSON

MALLA REDDY ENGINEERING COLLEGE(AUTONOMOUS)-Hyderabad

Part 1 : General Information

General Information:

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

MALLA REDDY ENGINEERING COLLEGE(AUTONOMOUS)

State	Telangana
Principal Investigrator Name:	Dr. P JOEL JOSEPHSON
Category:	General
Type of the Institue :	Academic Institutions (Private)
Project Title :	Empowering students for Monitoring their well-being in health, cleanliness with IoT techniques.
Division :	NCSTC
Programme Or Scheme :	NATIONAL CHILDRENS SCIENCE CONGRESS AND INITIATIVES FOR CHILD SCIENTSTS RESEARCH AND INNOVATIONS
Academic Area :	Electronics,Computers and Communication Engineering,
Application Area :	Digital technologies, Entrepreneurship and Innovation, Health,
Goverment National Initiative :	Startup India, Smart Village, Innovate India,
Type of Proposal :	Proposal Against Call
Project Duration :	1 Years
Proposal Submit Date :	15/07/2023
Project Keywords :	Internet of things, Sensors, Digital literacy, Sill Development, Education

Project Summary :

Objectives of the project
1. To empower the students to develop IoT based system related to their wellbeing.
2. To enable students to identify the type of sensors for the implementation of daily activities.
3. To promote the skills and scientific temper of the students.

Approach and Methodology/Workplan

The approach to conduct the project and methodology includes activities dived in 4 cluster specified as follow

1. Pre-Implementation Phase
- Conduct a needs assessment to understand the requirements, demographics, and interests of the target student population.
- Identify and secure funding sources to support the program logistics, resources, and infrastructure.
- Form a project team comprising program coordinators, trainers, mentors, and administrative staff.
- Develop a detailed project plan, including timelines, deliverables, and resource allocation.

2. Program Design and Curriculum Development

- Design a comprehensive curriculum that covers IoT fundamentals, hardware, software, programming, and project development.
- Create learning materials, presentations, and handouts for each module of the curriculum.
- Incorporate practical exercises, case studies, and real-life examples to enhance the learning experience.
- Align the curriculum with the specific goals and learning outcomes of the program.

3. Resource Acquisition and Setup

- Identify and acquire necessary IoT hardware, sensors, development boards, and tools required for the hands-on training sessions.
- Establish a dedicated learning space equipped with the necessary infrastructure, such as computers, internet connectivity, and development platforms.
- Set up software tools and platforms for programming, data collection, and analysis.
- Ensure the availability of adequate trainers, mentors, and technical experts to facilitate the training sessions.

4. Awareness Campaign and Student Recruitment

- Develop promotional materials, including brochures, posters, and social media content, to raise awareness about the program.
- Collaborate with educational institutions, community centers, and local organizations to reach out to potential participants.
- Organize information sessions, workshops, and webinars to introduce IoT concepts and the program details.
- Conduct student recruitment and selection processes based on criteria such as interest, commitment, and eligibility.

5. Training and Project Development

- Commence the training sessions according to the designed curriculum and schedule.
- Conduct theoretical and hands-on sessions to impart knowledge and practical skills related to IoT technology.
- Assign mentors or trainers to guide students in their IoT project development.
- Facilitate regular mentoring sessions to provide technical assistance, project guidance, and feedback.
- Encourage collaboration and teamwork among participants to foster a supportive and interactive learning environment.

6. Project Showcase and Competitions

- Set a timeline for participants to complete their IoT projects.
- Organize a project showcase event where students can exhibit and present their completed projects.
- Invite a panel of judges comprising industry experts, educators, and professionals to evaluate the projects.
- Recognize outstanding projects through awards, certificates, or prizes.
- Provide networking opportunities for participants to connect with potential mentors, investors, or industry partners.

7. Community Outreach and Impact Assessment

- Organize community-focused events to showcase the practical applications of IoT technology.
- Collaborate with local organizations or NGOs to address local challenges using IoT solutions.
- Evaluate the impact of the program through post-program assessments, feedback surveys, and interviews.
- Monitor the long-term engagement of participants with IoT technology and track their involvement in subsequent initiatives.
- Collect success stories, case studies, and testimonials to demonstrate the program's impact.

8. Program Evaluation

- Conduct a comprehensive evaluation of the program, considering feedback from participants, trainers, and

stakeholders.
- Identify areas for improvement and make necessary adjustments to the curriculum, training methods, or program structure.
- Seek continuous feedback from participants and stakeholders to ensure the program's effectiveness and relevance.
- Use the evaluation findings to inform future iterations of the program and enhance its impact.

The deliverables/ desired benefits to target groups/expected outcomes, their utilization

Deliverables/Desired Benefits to Target Groups/Expected Outcomes Their Utilization are as follows

1. Deliverables

- Comprehensive IoT curriculum covering fundamentals, hardware, software, and project development.
- Training materials, presentations, and handouts for each module of the curriculum.
- IoT hardware, sensors, and development boards for hands-on training sessions.
- Dedicated learning space equipped with necessary infrastructure computers, internet connectivity, development platforms.
- Promotional materials brochures, posters, social media content for awareness and recruitment.
- Project showcase event for students to exhibit their completed IoT projects.
- Recognition through awards, certificates, or prizes for outstanding projects.
- Evaluation reports and documentation of program implementation and outcomes.

2. Desired Benefits to Target Groups

a Students
- Increased awareness and understanding of IoT technology and its applications.
- Acquisition of practical skills in IoT hardware, programming, and project development.
- Empowerment to leverage IoT technology for problem-solving and innovation.
- Enhanced digital literacy and technological competence.
- Opportunities for networking, mentorship, and exposure to industry professionals.
- Improved employability in the IoT industry or entrepreneurship prospects.

b Educational Institutions
- Enriched curriculum with IoT-related content and practical application.
- Strengthened collaboration with industry partners and local organizations.
- Enhanced reputation and recognition for promoting cutting-edge technology education.
- Increased student engagement, motivation, and participation in technology-related initiatives.

3. Expected Outcomes and Their Utilization

a Increased Awareness and Understanding
- Students will have a clear understanding of IoT technology, its benefits, and potential applications.
- Utilization Students can utilize this knowledge to explore career opportunities, pursue further education, or apply IoT concepts to other fields.

b Acquisition of Practical Skills
- Students will gain hands-on experience in IoT hardware, programming, and project development.
- Utilization Students can utilize these skills to develop IoT projects, work on industry assignments, or contribute to local community initiatives.

c Innovative IoT Projects
- Students will develop innovative IoT projects addressing local challenges or specific domains.
- Utilization These projects can be implemented to create a positive impact in areas such as healthcare, agriculture, energy, or transportation, benefiting the target communities.

d Improved Employability
- Students will enhance their employability in the IoT industry by acquiring in-demand skills.
- Utilization Students can utilize their improved employability to secure internships, jobs, or entrepreneurial opportunities in IoT-related companies or start-ups.

e Enhanced Digital Literacy
- Students will improve their digital literacy and technological competence.
- Utilization Students can utilize these digital literacy skills in various aspects of their personal and professional lives, adapting to the digital transformation happening in society.

The deliverables, benefits, and outcomes of the program contribute to the overall growth and development of the target groups, fostering innovation, employability, and societal impact through the utilization of IoT technology.

Part 2: Particulars of Investigators

Principal Investigator:

1. Name:	Dr. P JOEL JOSEPHSON
Gender:	Male
Date of Birth:	14/01/1984
Designation :	Associate Professor
Department:	Electronics and Communication Engineering
Institute/University:	MALLA REDDY ENGINEERING COLLEGE(AUTONOMOUS)
State:	Telangana
District:	MEDCHAL MALKAJGIRI
City/Place:	Hyderabad
Address:	Maisammaguda, Dhulapally, (post via Kompally), Secundarabad, Telangana.
Pin:	500100
Communication Email:	joeljosephsonp@gmail.com
Alternate Email:	pjoelece@mrec.ac.in
Mobile:	9885217197
Phone:	
Fax:	
Category:	General

Co-Investigator:

1. Name:	Dr. Rahul Kumar
Gender:	Male

Date of Birth:	20/07/1989
Designation :	Assistant Professor
Department:	ECE
Institute/University:	MALLA REDDY ENGINEERING COLLEGE(AUTONOMOUS)
State:	Telangana
District:	MEDCHAL MALKAJGIRI
City/Place:	SECUNDERABAD
Address:	Maisammaguda(H), Gundlapochampally Village, Medchal Mandal, Medchal-Malkajgiri District, Telangana State - 500100
Pin:	500100
Communication Email:	rahulmishra070@gmail.com
Alternate Email:	
Mobile:	9140056680
Phone:	
Fax:	
Category:	General

2.

Name:	Dr. M Jagdeesh Chandra Prasad
Gender:	Male
Date of Birth:	13/01/1975
Designation :	Professor
Department:	ECE
Institute/University:	MALLA REDDY ENGINEERING COLLEGE(AUTONOMOUS)
State:	Telangana
District:	MEDCHAL MALKAJGIRI
City/Place:	Secunderabad

Address:	Maisammaguda, Dhulapally, Secunderabad 500100
Pin:	500100
Communication Email:	jagadishmatta@gmail.com
Alternate Email:	
Mobile:	9493131864
Phone:	
Fax:	
Category:	General

Part 3: Suggested Refrees

Suggested Refrees: NA

Part 4: Financial Details

Financial Details:

A. Non - Recurring

B. Recurring

Project Staff

S.	Project Staff	No.	Justification	1 Year	Total
1 .	Project Assistant	1	To prepare documents and support the project associate	264000	264000
2 .	Project Associate-I	1	Provide training to children	372000	372000
			Total	**636000**	**636000**

Consumables

S.	Items	Qty.	Justification	1 Year	Total
1 .	,Jumper wires- M - F,F - M,M - M	1000	connecting hardware components	135000	135000
2 .	Adapter,32GB SD Card,DHT-11 Sensor	100	To store data and hardware implementation	140000	140000
3 .	Aurdino UNO	100	processor for IoT application	70000	70000
4 .	Buzzer	100	to measure the output of IoT	4000	4000
5 .	LCD Screen	100	display the output	47000	47000
6 .	LED - 3 Colors	1500	IoT application	3000	3000
7 .	PIR sensors	100	detect the signal for processing	17000	17000
8 .	Push Button,NODE NCU	200	connecting hardware components	91000	91000
9 .	Raspberri Pi 4	100	Processor for IoT applications	400000	400000
10 .	Resistors,Capacitors,Transistors,relay,Bread board	200	Electrical components to make IoT hardware	59000	59000

11 .	Servo motor,DC Motor	100	required to demonstrate the IoT applications	31000	31000
12 .	Soil Mixture Sensors,MQ3,IR Sensor,LDR Sensor,Touch Sensor,Rain detector,Color detector sensor,Light Sensor,Alcohol detector,Heart beat sensor,Smoke Sensor,IR Sensor	100	To detect the signal for processing	181000	181000
13 .	Ultra Sonic Sensors	100	Sensing the sound for processing	11000	11000
			Total	**1189000**	**1189000**

Contingency

S.	Description	Justification	1 Year	Total
1 .	Contingency	Price increase due to unexpected conditions	50000	50000
		Total	**50000**	**50000**

Travel

S.	Description	Justification	1 Year	Total
1 .	Travel	Transport for the students and trainers	80000	80000
		Total	**80000**	**80000**

Overhead

S.	Description	Justification	1 Year	Total
1 .	overhead	Usage of laboratories, Internet facility, Electricity etc.	25000	25000
		Total	**25000**	**25000**

Any Other Recurring

S.	Description	Justification	1 Year	Total
1 .	Prize distribution	conduct the competitions to students and award the prize for winners	100000	100000
2 .	Stationary	stationaries and Printing the training materials	100000	100000
		Total	**200000**	**200000**

Budget Head Summary in (INR)

Budget Head	Year-1	Total
1- Non-Recurring		
Subtotal (Capital)	0	**0**
2- Recurring		
Project Staff	636000	**636000**
Consumables	1189000	**1189000**
Contingency	50000	**50000**
Travel	80000	**80000**
Overhead	25000	**25000**
Any Other Recurring	200000	**200000**
Subtotal (General)	2180000	**2180000**
Total Project Cost (Capital + General)	**2180000**	**2180000**

Part 5: PFMS Details

PFMS Unique Code Available: Yes

PFMS Unique Code : TLML00000156

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

FORMAT FOR WRITING THE PROPOSAL

As per Guidelines & General Information for Submitting Proposals to NCSTC June 2023

101 Title: **Empowering students for Monitoring their well-being in health, cleanliness with IoT techniques.**

102 Details of Principal Investigator/Principal Coordinator

Name **Dr P Joel Josephson**
Date of birth **14- January-1984**
Gender (Male/Female) **Male**
Whether Gen/OBC/SC/ST **Gen**
Designation & Organization
Associate Professor, Malla Reddy Engineering College
Complete address with Pin code
Maisammaguda, Dhulapally, Secunderabad 500100
Valid email address **joeljosephsonp@gmail.com**
Telephone, Mobile No **9885217197**

103 Details of Co-Investigator/Co-Coordinator

1. Name **Dr Rahul Kumar**
   Date of birth **20-July 1989**
   Gender (Male/Female) **Male**
   Whether Gen/OBC/SC/ST **Gen**
   Designation & Organization
   Assistant Professor, Malla Reddy Engineering College
   Complete address with Pin code
   Maisammaguda, Dhulapally, Secunderabad 500100
   Valid email address **rahulmishra070@gmail.com**
   Telephone, Mobile No **9140056680**

2. Name **Dr.M.Jagadeesh Chandra Prasad**
   Date of birth **13-Jan 1975**
   Gender (Male/Female) **Male**
   Whether Gen/OBC/SC/ST **Gen**
   Designation & Organization
   Professor & Head , Malla Reddy Engineering College
   Complete address with Pin code
   Maisammaguda, Dhulapally, Secunderabad 500100
   Valid email address **jagadishmatta@gmail.com**
   Telephone, Mobile No **9493131864**

104 Name & address of the Proposer Agency/Institution, Website url (if any)
Malla Reddy Engineering College, Maisammaguda, Dhulapally, Secunderabad 500100, www.mrec.ac.in

105 Organization/Institution's Registration number & Year: **5613/2001**
NGO Darpan Unique Id: **TS/2017/0154621**
PFMS Unique ID: **TLML00000156**
Bank Details as follows:
Agency Name in Bank: **Principal, Malla Reddy Engineering College**

Bank Name: **Union Bank of India, Bowenpally**
IFSC Code: **UBIN0532746**
Bank A/c No (attach cancelled cheque also) **327402010084316**

106 Name & Designation of the Head of the Proposer Agency & authorized & verifiable signatory from the Proposer Agency (In case, other than the Head)
Dr. A. Ramaswami Reddy,
Principal,
Malla Reddy Engineering College

107 Name, address, registration number, website url (if any) of the Collaborating Agency/ Institution (If any); whether Lead/Supporting partner & verifiable signatory from the Collaborating Agency
NA

108 Target Area/Place of activity :
District **Medchal-Malkajgiri**,
State: **Telangana**

The target area/place of activity for the Empowering Students with IoT program can vary based on the available resources and the specific needs of the community. Here are a few possible options:

1. Educational Institutions: The program can be implemented within schools, colleges, or universities to provide IoT awareness and training to students. This can be integrated into the existing curriculum or offered as an extracurricular activity.

2. Community Centers: Collaborating with community centers allows for reaching out to a broader audience beyond educational institutions. These centers can serve as venues for conducting workshops, training sessions, and project showcases.

3. Rural or Underserved Areas: It can be valuable to focus the program on rural or underserved areas where access to technology and IoT knowledge may be limited. This initiative can bridge the digital divide and empower students in these areas.

109 **Objectives of the project**

1. To empower the students to develop IoT based system related to their wellbeing.
2. To enable students to identify the type of sensors for the implementation of daily activities.
3. To promote the skills and scientific temper of the students.

110 **Project Activities proposed**

1. Program Launch and Orientation:
- Organize a program launch event to introduce the Empowering Students with IoT program to students, educators, and stakeholders.
- Conduct an orientation session to provide an overview of the program objectives, activities, and timelines.
- Distribute program handbooks or guides outlining the curriculum and resources.

2. Awareness Campaign:
- Plan and conduct workshops, seminars, and webinars on IoT fundamentals, applications, and

industry trends.
- Invite guest speakers from the IoT industry to share their knowledge and experiences.
- Create informative brochures, posters, and infographics to distribute among students and schools.
- Develop an online presence through a dedicated website or social media channels to disseminate information and updates.

3. Training Sessions and activity based learning:
- Design a series of training modules covering IoT hardware, sensors, communication protocols, and programming languages.
- Conduct hands-on sessions to familiarize students with IoT development platforms like Arduino, Raspberry Pi, or NodeMCU.
- Teach participants how to use relevant software tools for programming, data collection, and analysis.
- Provide practical exercises and projects to reinforce learning and encourage creativity.

4. Project Mentoring:
- Assign mentors or trainers to guide students throughout their IoT project development.
- Conduct regular mentoring sessions to provide technical assistance, project guidance, and feedback.
- Facilitate collaboration among participants to encourage knowledge sharing and peer learning.
- Monitor project progress, offer troubleshooting support, and ensure adherence to project timelines.

5. Project Showcase and Competitions:
- Organize a project showcase event where participants can exhibit their completed IoT projects.
- Invite a panel of judges comprising industry experts, educators, and professionals to evaluate the projects.
- Recognize outstanding projects through awards, certificates, or prizes.
- Provide participants with opportunities to network with potential mentors, investors, or industry partners.

6. Community Outreach:
- Collaborate with local organizations, schools, or community centers to organize IoT awareness sessions for the broader community.
- Conduct hands-on workshops or demonstrations to showcase the practical applications of IoT.
- Engage students in outreach programs where they can apply their IoT knowledge to address local challenges or contribute to social causes.

7. Evaluation and Feedback:
- Administer pre-program assessments to gauge students' baseline knowledge of IoT and their expectations.
- Conduct post-program assessments to measure the knowledge gained and skills developed by participants.
- Gather feedback from students, educators, and mentors through surveys or interviews to evaluate the program's effectiveness.
- Analyze the long-term engagement of students with IoT technology and track their

involvement in subsequent IoT-related initiatives.

8. Program Closure and Assessment:
- Organize a program closure event and presentations to celebrate the achievements and showcase the impact of the program.
- Summarize the outcomes, success stories, and lessons learned during the program.
- Assess the long-term impact by tracking participants' continued engagement in IoT projects, further education, or career choices.
.

111 **Languages to be employed** (for carrying out project activities)

Python coding language will be used to train students for their projects. Python is a high-level, interpreted, and general-purpose dynamic programming language that focuses on code readability. Students will be trained with small programming module to prepare over project. Starting from small projects like led blinking students will train to prepare complex projects based on IoT system.

112 **Project Duration: 1 year**

113 **Total Cost**

Non- Recurring cost Rs.	Recurring (Capital) cost Rs.	Total
0	21,80,000/-	Rs. 21,80,000/-

114 **Background & Justification for undertaking the proposed project w.r.t. goals of NSCTC**

Rural students as specified in section 115 are surveyed and found to be facing several challenges such as limited access to quality education, limited infrastructure and resources, and limited exposure to advanced technologies etc.. Monitoring the well-being of students is of utmost importance to ensure their holistic development, academic success, and overall health. The aim of this project is to train students in such a way that they will be able to develop the IoT device which helps in continuous monitoring and uplifting the overall living culture of their self and society. This section provides an overview of the importance of monitoring children's well-being and highlights the potential benefits of utilizing IoT technology in this context.

1. Bridging the Skills Gap: The rapid growth of IoT technology has created a significant skills gap in the workforce. By introducing an IoT awareness and training program, the project addresses this gap by equipping students with the knowledge and skills necessary to excel in the IoT industry. The program's hands-on training sessions and project-based approach enable students to develop practical skills aligned with industry requirements.

2. Promoting Technological Advancements: IoT technology is transforming industries across sectors, including healthcare, agriculture, energy, and transportation. By creating awareness and providing training in IoT, the project encourages students to explore innovative solutions that leverage IoT to address local challenges. This initiative contributes

to the promotion of technological advancements in line with NSCTC's objectives.

3. Empowering the Youth and Women Safety: The proposed project specifically targets students and the female community, empowering them to become active participants in the digital era and finding the mechanism to safe guard the girl students from unwanted situations. By providing them with knowledge, skills, and resources related to IoT and giving them awareness about the attacks happening on the women, the program fosters entrepreneurship, critical thinking, and problem-solving abilities. This empowerment aligns with NSCTC's goal of enabling the youth to drive India's growth and development.

4. Meeting Industry Demand: The IoT industry presents immense opportunities for employment and entrepreneurship. However, there is a shortage of skilled professionals in this field. The proposed project prepares students to meet the industry demand by equipping them with IoT-related skills. By providing practical training and engaging students in real-life projects, the program creates a talent pool aligned with the needs of the IoT industry.

5. Fostering Digital Literacy: The project contributes to enhancing digital literacy among students. By introducing IoT concepts, technologies, and programming languages, the program equips students with the digital skills required in today's technologically advanced world. This aligns with NSCTC's objective of promoting digital literacy and digital empowerment.

6. Encouraging Innovation and Entrepreneurship: The project encourages students to develop innovative IoT-based projects. By fostering creativity, critical thinking, and problem-solving skills, the program lays the foundation for entrepreneurial ventures. This aligns with NSCTC's goal of promoting a culture of innovation and entrepreneurship in India.

115 Target group(s), direct & indirect beneficiaries: (Whether Gen/OBC/SC/ST)
The target group of students belongs from the several rural areas of district Malkajgiri of Telangana state. The groups of students are divided in to 5 clusters for the training purpose as shown in List.

S.No	Name of the school and location	Strength	
1	MPPS Bahadurpally	30	**Cluster 1**
2	JPHS Bahadurpally	100	
3	Govt Junior College Bahadurpally	80	
4	St Ann’s Junior College for Girls	80	
5	St Ann’s High School	80	
6	ZPHS Kukatpally	120	
7	ZPH Boys Malkajgiri	100	
8	Gurukula Vidhyapeeth High School	100	
9	Shanitiniketan Vidhyalay Residential School	80	
10	ZPHS Kushaiguda	100	
11	Govt Junior College Bolaram	80	
12	Aided EVIS School UPS, Uppal	70	
Total		**1020**	

S. No	Name of the school and location	Strength	
1	Rao High School Balaji Nagar	50	
2	Rajaram Vidya Bhavan high school	50	

3	Takshashila Public School kuktapally	50	**Cluster 2**
4	Jawahar Navodhaya Vidhyalaya	60	
5	S Ssss Siddharth Rural High School	50	
6	ZPHS Uppal	100	
7	ZPHS Kothapet	100	
8	ZPHS Bogaram	80	
9	ZPHS Mallapur	100	
10	ZPHS Nizampet	80	
11	Govt Junior College Malkajgiri	100	
12	ZPHS Boys School Moosapet	100	
13	ZPHS Kowkur	80	
Total		**1000**	

S.No	**Name of the school and location**	**Strength**	
1	ZPHS Vanasthalipuram	100	**Cluster 3**
2	Montessori Vidyalay	10	
3	ZPHS Saroor Nagar	100	
4	St Theresa Girls high School	100	
5	ZPHS Nagole	100	
6	Z P School LB Nagar	100	
7	ZPHS Ramakrishnapuram	100	
8	ZPHS Gundlapochampalli	80	
9	Round Table India ZPHS LB Nagar	100	
10	New Govt Junior College and Degree College Vivekananda Nagar Kukatpally	80	
11	ZPHS Balanagar	100	
12	Vivekananda Vidya Mandir	100	
Total		**1070**	

S.No	**Name of the school and location**	**Strength**	
1	ZPHS Macha Bollaram	80	**Cluster 4**
2	ZPHS Sanithi Nagar Kukatpally	80	
3	Govt Boys High School Sanath Nagar	80	
4	Stella Mary High School, Boduppal	80	
5	ZPHS Kapra	100	
6	ZPHS Boys Keesara	100	
7	Manjeera Gurukul Residential High School	80	
8	Govt High School Bolaram	100	
9	Govt High School Moulali	100	
10	ZPHS Girls Malkajgiri	70	
11	ZPHS Gandhinagar	100	
12	ZPHS Shahpurnagar	100	
13	ZPHS Qutballapur	100	
Total		**1170**	

116 **Approach and Methodology/Workplan**

The approach to conduct the project and methodology includes activities dived in 4 cluster specified as follow:

1. Pre-Implementation Phase:

- Conduct a needs assessment to understand the requirements, demographics, and interests of the target student population.
- Identify and secure funding sources to support the program logistics, resources, and infrastructure.
- Form a project team comprising program coordinators, trainers, mentors, and administrative staff.
- Develop a detailed project plan, including timelines, deliverables, and resource allocation.

2. Program Design and Curriculum Development:

- Design a comprehensive curriculum that covers IoT fundamentals, hardware, software, programming, and project development.
- Create learning materials, presentations, and handouts for each module of the curriculum.
- Incorporate practical exercises, case studies, and real-life examples to enhance the learning experience.
- Align the curriculum with the specific goals and learning outcomes of the program.

3. Resource Acquisition and Setup:

- Identify and acquire necessary IoT hardware, sensors, development boards, and tools required for the hands-on training sessions.
- Establish a dedicated learning space equipped with the necessary infrastructure, such as computers, internet connectivity, and development platforms.
- Set up software tools and platforms for programming, data collection, and analysis.
- Ensure the availability of adequate trainers, mentors, and technical experts to facilitate the training sessions.

4. Awareness Campaign and Student Recruitment:

- Develop promotional materials, including brochures, posters, and social media content, to raise awareness about the program.
- Collaborate with educational institutions, community centers, and local organizations to reach out to potential participants.
- Organize information sessions, workshops, and webinars to introduce IoT concepts and the program details.
- Conduct student recruitment and selection processes based on criteria such as interest, commitment, and eligibility.

5. Training and Project Development:

- Commence the training sessions according to the designed curriculum and schedule.
- Conduct theoretical and hands-on sessions to impart knowledge and practical skills related to IoT technology.
- Assign mentors or trainers to guide students in their IoT project development.
- Facilitate regular mentoring sessions to provide technical assistance, project guidance, and feedback.
- Encourage collaboration and teamwork among participants to foster a supportive and interactive learning environment.

6. Project Showcase and Competitions:

- Set a timeline for participants to complete their IoT projects.
- Organize a project showcase event where students can exhibit and present their completed projects.
- Invite a panel of judges comprising industry experts, educators, and professionals to evaluate the projects.
- Recognize outstanding projects through awards, certificates, or prizes.
- Provide networking opportunities for participants to connect with potential mentors, investors, or industry partners.

7. Community Outreach and Impact Assessment:

- Organize community-focused events to showcase the practical applications of IoT technology.
- Collaborate with local organizations or NGOs to address local challenges using IoT solutions.
- Evaluate the impact of the program through post-program assessments, feedback surveys, and interviews.
- Monitor the long-term engagement of participants with IoT technology and track their involvement in subsequent initiatives.
- Collect success stories, case studies, and testimonials to demonstrate the program's impact.

8. Program Evaluation:

- Conduct a comprehensive evaluation of the program, considering feedback from participants, trainers, and stakeholders.
- Identify areas for improvement and make necessary adjustments to the curriculum, training methods, or program structure.
- Seek continuous feedback from participants and stakeholders to ensure the program's effectiveness and relevance.
- Use the evaluation findings to inform future iterations of the program and enhance its impact.

117 Time schedule giving milestones

The time scheduling for each cluster is shown with the aid of the tables given below.

<table>
<tr><td colspan="4">Training and Project Development:</td></tr>
<tr><td>Activities</td><td colspan="3">Day 1 Basic introduction using sensor devices</td></tr>
<tr><td></td><td>Session 1:
Creating basic understanding</td><td>Session 2:
Introduction to Electronic Components</td><td>Session 3
Introduction to the Sensor Devices</td></tr>
<tr><td></td><td colspan="3">Day 2 Introduction to IoT Systems</td></tr>
<tr><td></td><td>Session 1:
Introduction to basic networking</td><td>Session 2:
Introduction to IoT Devices</td><td>Session 3:
Practice session with the sensors and IoT Components</td></tr>
</table>

	Day 3 Hands-on implementation		
	Session 1 Introduction with PCB Design and circuit implementation	Session 2 Hands on with sensor devices and data acquisition	Session 3 Implementing a small sensor module with IoT

118 Organization's experience along with activities in the area of science communication, list of on-going & completed projects

Sl. No.	Name of the project and Reference No	Funding Agency/Division	Status
1	Impact of Artifical Intelligence in the field of Agriculture & AICTE/1650613785	AICTE- ATAL FDP	Completed
2	Student club under the scheme for Promoting Interests, Creativity and Ethics among Students (SPICES) & File No: 10-73/AICTE/IDC/SPICES/2020-21	AICTE	Completed
3	Advanced Training Program on Teaching & ISTE/AICTE-ISTE FDP/1-3513716560/2018-19	AICTE	Completed
4	Finite Element Analysis using ABAQUS & Ref . N o. 3 4-66 / 67 / F DCISTTP/ P o I i cv -L / 2oI9 -20	AICTE-STTP	Completed
5	Teaching-Pedagogical Intelligence & Ref. No. 3+-67 /1.12/FDC/FDp/p- r/201.s_20	AICTE, FDP	Completed
6	Solar Desalination for Nano and Micro Hierarchical Structures & Procs No.JNTUH/TEQIP-III/CRS/2019/MECH/01	JNTU-Hyderabad	Completed
7	Software defined Radio Lab & F.No.9-204/RIFD/MODROB/POLICY-1/2017-18	AICTE-MODROB	Completed
8	Big Data Analytics using R, Hadoop and Spark & F.No.34-55/223/RIFD/FDP/POLICY-1/2017-18	AICTE-FDP	Completed
9	Research Methodology in Engineering and Technical writing using LaTex & F.No.34-56/70/RIFD/STTP/ POLICY-1/2017-18	AICTE-STTP	Completed
10	LabVIEW for Measuremnt and Data Analysis & F.No.34-56/109/RIFD/STTP/ POLICY-1/2017-18	AICTE-STTP	Completed
11	Recent Trends in Mineral Exploration & Lr NoCRP/HRD/695/II/2295	SCCL	Completed

12	Recent Trends in Mineral Exploration	Mining Engineer's Association of India	Completed
13	Engineering Drawing - An Effective Teaching Methodology & ISTE/AICTE-ISTE Induction/Refresher Program/2018	AICTE-STTP	Completed
14	Unnat Bharat Abhiyaan & D.O. No. 5-1/2016-UBA	UBA	Completed
15	Modernization of Microwave Engineering lab & F.No.9- I 97 IIDCIMODROB/Policy-| 12019-20	AICTE, MODROB	On - going
16	Research laboratory for power quality analysis and enrichment & File No. B-214IR.IFD,/RPS {POLICY-1)/2078	AICTE-RPS	On - going
17	PERFORMANCE AND VIBRATION CHARACTERISATTON of Rubber seed oil Methyl Ester(RSME) Bio-Diesel BASED VCR ENGINE MOUNTED ON AI6O51-SIC-RUBBER MOUNTS & File No. 8-38/FDclRPs (POttcY-l) l20L9-20	AICTE-RPS	On - going
18	Margdashan Initiative & F.No. 5B-41 /Margdarshak Cell/2020 -21	AICTE	On-going
19	A Smart Agriculture Application Development for Monitoring the Fields Using IoT and AI & AI4E-2259-T5L7-21100407	Microsoft AI for Earth	On-going
20	Skill and Personality Development Programme Center for SC/ ST Students SPDC & F; IIo. 65.26/IDC/SPDC/POLIC-1/2019-20	AICTE-SPDC	On-going
20	Design and Development of Electrocoagulation unit for the processing of Electroplating waste water & F.No.8-23/FDC/RPS/POLICY-1/2021-22	AICTE-RPS	On-going

119 Project Management with clear description of roles and responsibilities

The Roles and Responsibilities of Principal Investigator and co- Principal Investigator for management of project are as follow:

Principal Investigator (PI):

1. Leadership: The PI is responsible for overall project leadership and management. PI will coordinate and oversee the project from start to finish.

2. Project Planning: The PI develops the project plan, sets goals and objectives, and defines the scope of the training program.

3. Funding and Budgeting: The PI identifies and secures funding sources for the project. They also manage the project budget, ensuring that resources are allocated appropriately.

4. Stakeholder Engagement: The PI establishes and maintains relationships with key stakeholders such as educational institutions, government agencies, and community organizations.

5. Monitoring and Evaluation: The PI establishes mechanisms to monitor the progress of the project, assesses its impact, and identifies areas for improvement.

Co-Principal Investigator (Co-PI):

1. Project Support: The Co-PI assists the PI in various aspects of the project, providing support and sharing responsibilities.

2. Research and Development: The Co-PI will be involved in exploring innovative approaches, and contributing to the development of the training program.

3. Training Design: The Co-PI works closely with the PI and other team members to design the curriculum, instructional materials, and learning resources for the IoT training.

4. Quality of the training program: The Co-PI ensures the quality of the training program by reviewing and evaluating the curriculum, instructional methods, and assessments.

6. Collaboration and Communication: The Co-PI collaborates with other team members, stakeholders, and trainers to ensure effective communication and coordination.

120 **Monitoring, Evaluation, Lesson Learning and Beneficiary Feedback**

Monitoring: The students are monitored from the beginning of the project implementation.

Evaluation: With the help of practice session and Quizzes' monitoring the students understanding about the sensors and IoT Devices.

Lesson Learning: The sessions are conducted to students to learn the things in each session one after the other.

Beneficiary Feedback: The feedback is taken from the students asking their opinion about the training given and their understanding on it.

121 **The deliverables/ desired benefits to target groups/expected outcomes, & their utilization**

Deliverables/Desired Benefits to Target Groups/Expected Outcomes & Their Utilization are as follows:

1. Deliverables:

- Comprehensive IoT curriculum covering fundamentals, hardware, software, and project development.

- Training materials, presentations, and handouts for each module of the curriculum.
- IoT hardware, sensors, and development boards for hands-on training sessions.
- Dedicated learning space equipped with necessary infrastructure (computers, internet connectivity, development platforms).
- Promotional materials (brochures, posters, social media content) for awareness and recruitment.
- Project showcase event for students to exhibit their completed IoT projects.
- Recognition through awards, certificates, or prizes for outstanding projects.
- Evaluation reports and documentation of program implementation and outcomes.

2. Desired Benefits to Target Groups:

a) Students:
- Increased awareness and understanding of IoT technology and its applications.
- Acquisition of practical skills in IoT hardware, programming, and project development.
- Empowerment to leverage IoT technology for problem-solving and innovation.
- Enhanced digital literacy and technological competence.
- Opportunities for networking, mentorship, and exposure to industry professionals.
- Improved employability in the IoT industry or entrepreneurship prospects.

b) Educational Institutions:
- Enriched curriculum with IoT-related content and practical application.
- Strengthened collaboration with industry partners and local organizations.
- Enhanced reputation and recognition for promoting cutting-edge technology education.
- Increased student engagement, motivation, and participation in technology-related initiatives.

3. Expected Outcomes and Their Utilization:

a) Increased Awareness and Understanding:
- Students will have a clear understanding of IoT technology, its benefits, and potential applications.
- Utilization: Students can utilize this knowledge to explore career opportunities, pursue further education, or apply IoT concepts to other fields.

b) Acquisition of Practical Skills:
- Students will gain hands-on experience in IoT hardware, programming, and project development.
- Utilization: Students can utilize these skills to develop IoT projects, work on industry assignments, or contribute to local community initiatives.

c) Innovative IoT Projects:
- Students will develop innovative IoT projects addressing local challenges or specific domains.
- Utilization: These projects can be implemented to create a positive impact in areas such as healthcare, agriculture, energy, or transportation, benefiting the target communities.

d) Improved Employability:
- Students will enhance their employability in the IoT industry by acquiring in-demand skills.
- Utilization: Students can utilize their improved employability to secure internships, jobs, or entrepreneurial opportunities in IoT-related companies or start-ups.

e) Enhanced Digital Literacy:
- Students will improve their digital literacy and technological competence.
- Utilization: Students can utilize these digital literacy skills in various aspects of their personal and professional lives, adapting to the digital transformation happening in society.

The deliverables, benefits, and outcomes of the program contribute to the overall growth and development of the target groups, fostering innovation, employability, and societal impact through the utilization of IoT technology.

122 Detailed budgetary requirement, both recurring and non-recurring (capital),along with justification budget head wise & give account of self-generated Resources

TOTAL BUDGET

BUDGET	YEAR 1	TOTAL
1- Non-Recurring		0
Subtotal (Capital)	0	0
2- Recurring		0
Project Staff	636000	636000
Consumables	1189000	1189000
Contingency	50000	50000
Travel	80000	80000
Overhead	25000	25000
Any Other Recurring	200000	200000
Subtotal (General)	2180000	2180000
Total Project Cost (Capital + General)	2180000	2180000

PROJECT STAFF

SR.NO.	YEAR	PROJECT STAFF	PROJECT STAFF DETAILS	TOTAL NO.	TOTAL EMOLUMENTS	TOTAL COST
1	Year 1	Project Assistant	To prepare documents and support the project associate	1	264000.00	264000.00

2	Year 1	Project Associate-I	Provide training to children	1	372000.00	372000.00

CONSUMABLES

S.No	Year	Comsumable details	Justification	Quantity	Amount	Total
1	Year 1	Raspberry Pi 4	Processor for IoT applications	100	4000.00	400000.00
2	Year 1	Adapter 32 GB SD Card DHT-11 Sensor	To store data and hardware implementation	100	1400.00	140000.00
3	Year 1	Soil Mixture Sensors, MQ3,IR Sensor,LDR Sensor,Touch Sensor,Rain detector,Color detector sensor,Light	To detect the signal for processing	100	1810.00	181000.00
4	Year 1	Aurdino UNO	processor for IoT application	100	700.00	70000.00
5	Year 1	Resistors, Capacitors,Transistors,relay, Bread board	Electrical components to make IoT hardware	200	295.00	59000.00
6	Year 1	Servo motor,DC Motor	required to demonstrate the IoT applications	100	310.00	31000.00
7	Year 1	LED - 3 Colors	IoT application	1500	2.00	3000.00
8	Year 1	Ultra	Sensing	100	110.00	11000.00

		Sonic Sensors	the sound for processing			
9	Year 1	LCD Screen	display the output	100	470.00	47000.00
10	Year 1	PIR sensors	detect the signal for processing	100	170.00	17000.00
11	Year 1	Push Button,NODE NCU	connecting hardware components	200	455.00	91000.00
12	Year 1	Jumper wires- M - F,F - M,M - M	connecting hardware components	1000	135.00	135000.00
13	Year 1	Buzzer	to measure the output of IoT	100	40.00	4000.00

TRAVEL

S.No	Year	Description	Justification	Amount
1	Year 1	Travel	Transport for students and trainers	80000.00

CONTINGENCY

S.No	Year	Description	Justification	Amount
1	Year 1	Contingency	Price increased due to unexpected conditions	50000.00

OTHER RECURRING

S.No	Year	Description	Justification	Amount
1	Year 1	Stationary	Stationaries and printing the training material	100000.00
2	Year 1	Price distribution	Conduct the competitions to students and	100000.00

			award the price for winners	

OVERHEAD

S.No	Year	Description	Justification	Amount
1	Year 1	Overhead	Uses for laboratories internet facility electricity etc.	25000.00

123 **MANDATORY DECLARATION:** Whether submitted all required enclosures & certificate(s) as per list attached (Yes/No or state whichever is not submitted)

YES

PROFORMA FOR BIODATA OF PRINCIPAL INVESTIGATOR/ COORDINATOR

A.) Name: **Dr. P. Joel Josephson**

B.) Date of Birth: **14/01/1984**

C.) Institution with Full Address: **Malla Reddy Engineering College, Maisammaguda, Dhullapally post, Via Kompally, Secunderabad, Telangana State, India – 500100**

D.) Whether belongs to SC/ST: **NO**

E.) Academic and Professional Career:
Academic Career: **PhD (Embedded Systems)**
Professional Career: **Associate Professor**

F.) Award/Prize/Certificates etc. won by the coordinator:
Best Researcher Award in the year 2022
Best Inventor Award in the year 2022

G.) Publication (Number & Titles Only):

Books: 3

1. Analog and Digital Electronics with GATE(As per AICTE Model Curriculum 2018) Paperback – 1 January 2021
Publisher : SunRaise International Publishers (1 January 2021)
Language : English
ISBN-10 : 8195267866
ISBN-13 : 978-8195267866
Buy Analog and Digital Electronics with GATE(As per AICTE Model Curriculum 2018) Book Online at Low Prices in India | Analog and Digital Electronics with GATE(As per AICTE Model Curriculum 2018) Reviews & Ratings - Amazon.in

2. Digital System Design(Digital Electronics)with GATE(As per AICTE Model Curriculum 2018) Paperback – 1 January 2021
Publisher : SevenHills International Publishers (1 January 2021)
Language : English
ISBN-10 : 8195391826
ISBN-13 : 978-8195391820
Buy Digital System Design(Digital Electronics)with GATE(As per AICTE Model Curriculum 2018) Book Online at Low Prices in India | Digital System Design(Digital Electronics)with GATE(As per AICTE Model Curriculum 2018) Reviews & Ratings - Amazon.in

3. DIGITAL IMAGE PROCESSING Book Rivers Publications – 24 June 2022 by Dr. Shashidhar Sonnad (Author), Dr.Vybhav (Author), Dr. Kapil Joshi K Dr.P.Joel Josephson (Author)
Publisher : Book Rivers; 1st edition (24 June 2022)
Language : English
Unknown Binding : 209 pages
ISBN-10 : 9355151454
ISBN-13 : 978-9355151452
DIGITAL IMAGE PROCESSING : Dr. Shashidhar Sonnad, Dr.Vybhav, K Dr.P.Joel Josephson ,Dr. Kapil Joshi: Amazon.in: Books

Research papers, Reports: 17
7 (SCI) + 3(Scopus) + 7(Conference Papers)

1. **Artificial neural networks-based improved Levenberg–Marquardt neural network for energy efficiency and anomaly detection in WSN**
Revanesh M.;Gundal S.S.;Arunkumar J.R.;Josephson P.J.;Suhasini S.;Devi T.K.
Wireless Networks, Volume , Year 2023

2. **Medical image enhancement in health care applications using modified sun flower optimization**
Navaneetha Krishnan S.;Yuvaraj D.;Banerjee K.;Josephson P.J.;Kumar T.C.A.;Ayoobkhan M.U.A. Optik, Volume 271, Year 2022

3. **Setpoint Tracking and Disturbance Rejection in Automobile using Predictive Controller** G. Rohini ., R. Ragumadhavan ., G. Bhavani ., P Joel Josephson ., Kamal Alaskar ., 3rd International Conference on Smart Electronics and Communication, ICOSEC 2022 - Proceedings, Volume , Year 2022, Pages 212-218

4. **Routing Path Selection and Data Transmission in Industry-Based Mobile Communications Using Optimization Technique**
Wireless Communications and Mobile Computing, Volume 2022, Year 2022

5. **Exploratory Data Analysis Based on Micro grids Generation for Control Communication and Monitoring via Wireless Sensor Network**
Bharti Jain ., Shrinivas Sirdeshpande ., M S Gowtham ., P Joel Josephson ., M. Kalyan Chakravarthi ., Bhasker Pant ., 2022 2nd International Conference on Advance Computing and Innovative Technologies in Engineering,
ICACITE 2022, Volume , Year 2022, Pages 1231-1235

6. **A novel algorithm for real time task scheduling in multiprocessor Environment** Josephson J.;Ramesh R. Cluster Computing, Volume 22, Year 2018, Pages 13761-13771

7. **A novel algorithm for real-time framework in multiprocessor environment** Pottipadu J.;Ramesh R.Design Automation for Embedded Systems, Volume 21, Year 2017, Pages 213-229

Research papers, Reports: 3 (Scopus)

8. **"Empowering Scientific temper through Cognitive learning among higher secondary students"** Joel Josephson P et al in "International Journal of Early Childhood Special Education (INT-JECSE)" May 2022.

9. **"Exploratory Data Analysis Based on Micro grids Generation for Control Communication and Monitoring via Wireless Sensor Network"** Joel Josephson P et al in "IEEE Xplore" (Scopus), July 2022.

10. **"Wireless Level Monitoring of Interfacing Two-Tank System through User Datagram Protocol"** Joel Josephson P et al in IEEE Xplore, May 2023

Research papers, Reports: 7 (Conference Papers)

1. Published a paper titled as **"Real Time Scheduler Simulator Framework for Multi-Processor Embedded Application: A Review"** P.Joel Josephson, Dr.R.Ramesh and C.Yaashuwanth. International Conference on Information Technology, Electronics and Communications (ICITEC – 11) Hyderabad, India, November 29- 30, 2011.
2. Published a paper titled as **"A Cluster based Scheduling Algorithm (CBSA) for Multiprocessor Systems"** P.Joel Josephson, International Conference on Intelligent Systems, Electrical Communication Technology (ICISECT – 21) Hyderabad, India, April 9-10, 2021.
3. Published a paper titled as **"Soldier Health & Position Tracking System"** P.Joel Josephson, Milaliyan Samantaray, Preethi Roshan, G. Rakesh. International Conference on Smart Modernistic in Electronics and Communication (ICSMEC – 21) Hyderabad, India, July 2-3, 2021.
4. Published a paper titled as **"Quadriplegics Wheelchair Control by Head Motion Using Accelerometer"** P.Joel Josephson, G Shiva Kumar Reddy, S Sathish Kumar Reddy, S Rajitha. International Conference on Smart Modernistic in Electronics and Communication (ICSMEC – 21) Hyderabad, India, July 2-3, 2021.
5. Published a paper titled as **"Histogram Equalization-Based Techniques for Contrast Enhancement of Mri Brain Glioma Tumor Images: Comparative Study"** P.Joel Josephson, K Kalpana, L Harshitha, D Sucharitha International Conference on Smart Modernistic in Electronics and Communication (ICSMEC – 21) Hyderabad, India, July 2-3, 2021.
6. Published a paper titled as **"Time Quantum Scheduling Algorithm"** P.Joel Josephson International Conference on Smart Modernistic in Electronics and Communication (ICSMEC – 22) Hyderabad, India, March 28-29, 2022.
7. Published a paper titled as **"Successive Interference Cancellation For MIMO-OFDM Systems"** Dr P.Joel Josephson, A Akhila, B Chandrika, PRashanth Reddy, G Samuel. International Conference on Smart Modernistic in Electronics and Communication (ICSMEC – 22) Hyderabad, India, March 28-29, 2022.

General Articles: 3

1. Published a paper titled as **"Framework for Real Time Heterogeneous Multiprocessor System using DYTAS Algorithm"** Joel Josephson P & Vaibhav Meshram in International Research Journal of Engineering and Technology (IRJET)., Volume: 06 Issue: 05. May 2019.
2. Published a paper titled as **"A Survey of Trolley/Wheel Chair based Smart System for Exclusive Medical Applications"** L.Subhashree, D.Sruthiraj, S.Vinitha, Joel Josephson in International Research Journal of Engineering and Technology (IRJET)., Volume: 03 Issue: 03. March 2018.
3. Published a paper titled as **"Modified Round Robin Algorithm for Task**

Scheduling" Joel Josephson P & Matta Jagadeesh Chandra Prasad in **International Journal for Recent Developments in Science and Technology December** 2019.

Patents: 13

1. Published a Patent titled "**Synthesis of e-waste based on machine learning and artificial intelligence autonomous management system for smart for environment**" with Number 202141044783A by Indian Government in October 2021.

2. Published a Patent titled "**Designing a Robot with Di-electric material to work in High Voltage Electric Environment**" with Number 202241013549A by Indian Government in March 2022.

3. Published a Patent titled "**Smart Solar Celled Vehicle with Nano particles for efficient utilization of Renewable Energy Resource**" with Number 202211015032A by Indian Government in April 2022.

4. Published a Patent titled "**Nano Electronics based Solar Cells for efficient Performance of absorption of Solar Energy**" with Number 202211013548A by Indian Government in April 2022.

5. Published a Patent titled "**A Machine learning based approach to analyze the characteristics of various nano materials for understanding their molecular aspects**" with Number 202241021302A by Indian Government in May 2022.

6. Published a Patent titled "**Design of a Secure wi-Fi based Home Automation system using internet of things**" with Number 202241027054A by Indian Government in May 2022.

7. Published a Patent titled "**The Embedded Security Framework for the industrial internet of things (IIOT) and Cyber Security**" with Number 202211030237A by Indian Government in June 2022.

8. Published a Patent titled "**A Hybrid Digital Image processing techniques for object detection from complex background image**" with Number 202241032151A by Indian Government in June 2022.

9. Published a Patent titled "**Classification models of early detection and Prediction of Cancer with improved efficiency**" with Number 202211052848A by Indian Government in October 2022.

10. Published a Patent titled "**ML based oldage people health monitoring system**" with Number 202211056721 by Indian Government in October 2022.

11. Published a Patent titled "**Systematic Approach integrated with convolutional neural network for predicting the air pollution and air**

pollutants in industrial area" with Number 202211059592A by Indian Government in November 2022.

12. Published a Patent titled **"The Impact Of Environmental Issues On Business Management"** by Indian Government in November 2022.

13. Published a Patent titled **"Deep Learning Based Technique For Analyzing The Impact Of Various Factors On Hydro Geo Chemistry Of Ground Water"** by Indian Government in December 2022.

Others (please Specify): NA

H.) List of Completed and on going projects (during the last three years):

NIL

S. No.	Title of the Project	Duration	Total Cost	Funding Agency	From	To

I.) List of Projects submitted (during the last three years): NIL

S. No.	Title of the Project	Name of Organization	Status

14/07/23

PROFORMA FOR BIODATA OF CO-INVESTIGATOR/ CO-COORDINATOR

A.) Name: **Dr. Rahul Kumar**

B.) Date of Birth: **20/07/1989**

C.) Institution with Full Address: **Malla Reddy Engineering College, Maisammaguda, Dhullapally post, Via Kompally, Secunderabad, Telangana State, India – 500100**

D.) Whether belongs to SC/ST: **NO**

E.) Academic and Professional Career:
Academic Career: **PhD (Wireless Communication)**

Professional Career: **Assistant Professor**

F.) Award/Prize/Certificates etc. won by the coordinator:

G.) Publication (Number & Titles Only):

Books: 0

Research papers, Reports: 09
5(SCI) + 1(Scopus) + 2(Conference Papers)+1(General Articles)

1. Kumar R, Soni SK. "**Performance evaluation of ED based spectrum sensing over fluctuating two ray fading channel.**" *AEU-International Journal of Electronics and Communications. 202*May 1;118:153143.

2. Kumar, Rahul, and Surender Kumar Soni. "**Impact of User Mobility on ED based Spectrum Sensing and Digital Communication Performance over FTR Fading Channel.**" *AEU-International Journal of Electronics and Communications* (2022): 154100.
3. Kumar, Rahul, and Surender Kumar Soni. "**Performance of energy detector based spectrum sensing over millimetre band communication channel with diversity reception.**"*Wireless Networks*27.8 (2021): 5073-5084.

4. Kumar, Rahul, and Surender Kumar Soni. "**On effective rate and energy detection based spectrum sensing over cascaded FTR fading channel.**" *AEU-International Journal of Electronics and Communications* 138 (2021): 153862.

5. Chauhan S, Kumar R, Saxena S, Kaur A, Daniel P. "**SemSyn: Semantic-Syntactic Similarity Based Automatic Machine Translation Evaluation Metric**". IETE Journal of Research. 2023 Apr 18:1-2.

Research papers, Reports: 1 (Scopus)

1. P. K. Verma, Rahul Kumar, "**Modeling and Performance Analysis of Energy Detector Based Spectrum Sensing with Maximum Ratio Combining Diversity over Nakagami-m/log-normal Fading Channels**", *International Journal of Communication Networks and Distributed Systems*, Inderscience Publishers, 2018.

Research papers, Reports: 7 (Conference Papers)

1. Rahul Kumar, P. K. Verma, "**Signal Space Estimation: Application to Subspace Spectrum Analysis**", In: Perez G., Tiwari S., Trivedi M., Mishra K. (eds) *Ambient Communications and Computer Systems. Advances in Intelligent Systems and Computing*, Springer, vol. 696, pp. 165-172, 2018.
2. P. K. Verma, Rahul Kumar, "**Performance Analysis of Blind Eigen Value with Multiple Antenna Based Spectrum Sensing in Cognitive Radio**", In: Perez G., Tiwari S., Trivedi M., Mishra K. (eds) *Ambient Communications and Computer Systems. Advances in Intelligent Systems and Computing*, Springer, vol. 696, pp. 155-164, 2018.

General Articles: 1

Singh, Shweta, and Rahul Kumar. **"Enhanced Detectability Using Multi-Cycle Cyclostationary Detector in Cognitive Radio."** *International Journal of Electronics, Communications, and Measurement Engineering (IJECME)* 11, no. 1 (2022): 1-14

Patents: 1

Devesh Mishra, Shweta Singh, Rahul Kumar, Devesh Tiwari, Krishna Kant Agrawal **WATER STORAGE TANK**. Indian Patent ID , April 4, 2023.

Others (please Specify): NA

H.) List of Completed and on going projects (during the last three years):

NIL

S. No.	Title of the Project	Duration	Total Cost	Funding Agency	From	To

I.) List of Projects submitted (during the last three years): NIL

S. No.	Title of the Project	Name of Organization	Status

PROFORMA FOR BIODATA OF Co INVESTIGATOR/CO-COORDINATOR

A.) Name : **Dr.M.Jagadeesh Chandra Prasad**
B.) Date of Birth : **13/01/1975**
C.) Institution with Full Address : **Malla Reddy Engineering College, Maisammaguda, Dhullapally post, Via Kompally, Secunderabad, Telangana State, India - 500100**
D.) Whether belongs to SC/ST : **NO**
E.) Academic and Professional Career:
Academic Career : **Professor & Head**
Professional Career : **Professor**
F.) Award/Prize/Certificates etc. won by the Coordinator:
Received Best Head of the Department Award for the 2 consecutive years 2020-21 & 2021-22
G.) Publication (Number & Titles Only):
Books : **NIL**
Research papers, Reports : **25**

1. Jagadeesh Chandra Prasad Matta, Siddiah. P, "Channel Estimation of massive MIMO Using Code Shift Keying Pilot Symbols (CSK-PS)", I.J. Image, Graphics

and Signal Processing, Volume 14, No.3, PP.23-31, June 2022.
2. Jagadeesh Chandra Prasad Matta and Siddiah. P, "The Perform and Analyses of Capacity MIMO Rician Fading Channels with Channel State Information" The International journal of analytical and experimental modal analysis Volume XIII, Issue VII, PP.3421-3429, July 2021.
3. B. Suman, M. J. Chandra Prasad, "Implementation of Multi Bit Error Detection and Correction using Low Density Parity Check Codes," 2022 1st IEEE International Conference on Industrial Electronics: Developments & Applications (ICIDeA), Bhubaneswar, India, 2022, pp. 89-94, doi: 10.1109/ICIDeA53933.2022.9970166.
4. Jagadeesh Chandra Prasad Matta, Siddiah P "A Modified OMP Algorithm with Reduced Feedback Overhead for Massive MIMO System". Indian Journal of Science and Technology 14(33): 2663-2670. https://doi.org/ 10.17485/IJST/v14i33.1442, 2021(WOS)
5. M.J.C.Prasad, "An improved VLSI design of 16 bit data Comparator using bubble sorting algorithm" Journal of Applied Science and Computations Volume VI, Issue V, May/2019 Page No: 2797 to 2806 (ISSN NO: 1076-5131)
6. M.J.C. Prasad, "Home appliances controlling using Web application & Raspberry pi", Journal of Interdisciplinary Cycle Research, Volume 11, Issue 1, January-2019, ISSN NO: 0022-1945, Pages 124-128.
7. M J C Prasad, Ganta Ramakrishna Reddy, "(CAM) architecture For Dynamic power minimization in content addressed Memory", The International journal of analytical and experimental modal analysis, ISSN NO: 0886-9367, Volume IX, Issue VI, June/2017, Pages 12-18.
8. M.J.C.Prasad, "Attendance Management And Monitoring System By Using Rfid & Zigbee" International Journal of Modern Trends in Engineering and Research (IJMTER) Volume 04, Issue 12, [December– 2017].
9. M. J C Prasad, S. China Venkateswarlu, P. Sandeep Kumar, "Speech Enhancement by Spectral Subtraction through Kaiser Window Shape", Journal of Interdisciplinary Cycle Research Volume IX, Issue IV, April/2017, ISSN NO: 0022-1945 Pages:12-23.
10. Dr. M.J.C.Prasad , Chakradhar Chegu, "A Remote Test Platform for Mobile Application" , Journal of Computing Technologies, ISSN: 2278 – 3814 Vol. 5 Issue 7 pg 40-44, 2016.
11. M J C Prasad, B Sagar, "Montgomery Reduction System based on Multiplication Algorithm", Journal of Interdisciplinary Cycle Research, ISSN NO: 0022-1945, Volume V, Issue II, July- December/2016, Pages 261-269.
12. M.J.C.Prasad, "Image and Gesture based Single User Transportation System", Journal of Computing Technologies (2278 – 3814) / # 13 / Volume 5 Issue 6 (Page No: 13 to 16), June,2016
13. V. Datta Kiran , Dr. M. J. C. Prasad, "Obstacle Detection in Textured Environment by using Color Coherence", International Journal of Innovative Technologies", ISSN 2321-8665 Vol.04,Issue.02, February-2016, Pages:0286-0291.
14. M. J C Prasad, Investigation on Multi-spectral Denoising by Intrinsic Tensor Sparsity Regularization, International Journal of Research, Vol. 5, Issue I, Jan-Jun 2016, ISSN No:2236-6124. Pages 204-207.
15. M.J.C.Prasad, N.Haritha, "ARM Based Smart Cart and Automatic Billing System with Theft Detection", Journal of Computing Technologies ISSN:2278 – 3814 Volume 5 Issue 6, Pages: 47-51(2016).
16. M.J.C.Prasad, "ARM Based Smart Cart and Automatic Billing System with Theft

Detection", Journal of Computing Technologies (2278 – 3814) / # 13 / Volume 5 Issue 6 (Page No: 47 to 51), June,2016

17. M.J.C.Prasad , "Obstacle Detection in Textured Environment by using Color Coherence, International Journal of Innovative Technologies , Volume 4,Issue 2 February, 2016,PP 286-291 ISSN 2321-8665.
18. M.J.C.Prasad , Yeligati Kiran " Prepayment of Electricity Units with theft controlling System" .International Journal of Research studies in Science, Engineering & Technology(IJRSSET) Volume 1,Issue 4 ,July 2014,PP 42-42 ISSN 2349-4751
19. M.J.C.Prasad, Mallam Usharani "Design & Development of a remote monitoring & maintenance of solar plant supervisory system". International Journal of Research studies in Science, Engineering & Technology(IJRSSET) Volume 1,Issue 4 ,July 2014,PP 42-42 ISSN 2349-4751.
20. M.J. C.Prasad " Implementation Of Concurrent Online MBIST For RFID Memories Using March SS Algorithm" . International Journal Of innovative technology and exploring engineering (IJITEE) ISSN: 2278-3075, Volume -3, issue-6, Nov 2013
21. M.J. C.Prasad" Implementation Of High Reliable Fine Grain Fault Tolerance Redundant Technique For FPGA" . International Journal Of SoftComputing And Engineering (IJSCE) ISSN: 2231-2307, Volume -3, issue-5, Nov 2013
22. K.Vani Sree, M.J.C.Prasad, Dr.V.S.K.Reddy." Efficient Throughput Analysis of non-cooperative routing protocols in MANETs. International Journal of Electrical,Electronics & Computing Technology, Vol-2 .ISSUE-5., Sep-Dec, 2011 issued of the journal @ ISSN 2229-3027.
23. M.J.C.Prasad. "FPGA Implementation of fast coding technique for image compression". NICE Journal of Emerging Technologies, 2005.
24. M.J.C.Prasad. "Design & Implementation of Wi-Fi Mac Transmitter and receiver". In the Journal of Instrumentation and signal processing, 5th, October, 2004.
25. M.J.C.Prasad. "Intersected Low density Parity Check and Convolution Codes". In Journal of Systematic, Cybernetics and Informatics, January 2004.

General Articles : **NIL**

Patents : **5**

1. YOLO R-CNN Method with Real Time Kaggle Dataset for Weapon Detection
2. Automated Inspection of Transmission Lines/Cell Tower using Virtual Reality
3. Low Power Video Streaming Architecture using Joint Fast and Brief Descriptor
4. Voice Controller System
5. Machine Parameters of Natural Fiber Particle Reinforced Polymer Composite Material Using Anova

Others (please Specify) : **NIL**

H.) List of Completed and on going projects (during the last three years):

NIL

I.) List of Projects submitted (during the last three years):

S.No.	Title of the Project	Name of Organization	Status
1.	Enhanced Face Recognition and Communication of UAV System using 5G and SDN	Telecom Technology Development Fund (TTDF) Scheme	Awaiting Presentation
2.	Preserving the Past for the Future: The Digitization of	Science and Heritage Research Initiative	Submitted

	Cultural Heritage	(SHRI)	
3.	Application for 5G use case lab in higher education Institutions	Department of Telecommunications Ministry of Communications, Government of India	Submitted

CERTIFICATE FROM THE INVESTIGATORS/CO-ORDINATOR(S) OF THE PROJECT

Project Title: **Empowering students for Monitoring their well-being in health, cleanliness with IoT techniques.**

1. I/We have gone through and agree to abide by the terms and conditions of the RVPSP/DST grant.

2. I/We have not submitted, nor do I/ We intend to submit this, or a similar project proposal, to any other agency for financial or other support.

3. I/We have explored and insured that hardware and basic facilities will actuallybe available from our organization as and when required for the purpose of this project no financial support under this project will be requested or utilized for these items.

4. I/We undertake to summit progress report, statements(s) of accounts, utilization certificates etc., periodically and at the end of each financial year.

5. I/We have enclosed the following materials.

ITEMS		NUMBER OF COPIES
(a)	Endorsement from the Head of the Institution (on letter head)	One
(b)	Certificate from Investigator	One
(c)	Certificate from Investigator regarding conflict of interest	One
(d)	Name and address of experts/institution interested in the subject/ outcome of the project	One
(e)	Copies of the proposals	One hard Copy

Name(s) & Signature(s) of Principal Investigator/Principal Coordinator,Co Investigator/Co- coordinator

1. Dr P Joel Josephson

2. Dr Rahul Kumar

3 Dr M Jagadeesh Chandra Prasad

Place: HYDERABAD
Date: 14.07.2023

DEPARTMENT OF SCIENCE AND TECHNOLOGY
POLICY ON CONFLICT OF INTEREST

FOR REVIEWER & COMMITTEE MEMBER or APPLICANT or DST OFFICER ASSOCIATED/ DEALING WITH THE SCHEME/ PROGRAM OF DST

Issues of Conflicts of Interest and ethics in scientific research and research management have assumed greater prominence, given the larger share of Government funding in the country's R & D scenario. The following policy pertaining to general aspects of Conflicts of Interest and code of ethics, are objective measures that is intended to protect the integrity of the decision making processes and minimize biasness. The policy aims to sustain transparency, increase accountability in funding mechanisms and provide assurance to the general public that processes followed in award of grants are fair and non-discriminatory. The Policy aims to avoid all forms of bias by following a system that is fair, transparent and free from all influence/ unprejudiced dealings, prior to, during and subsequent to the currency of the programme to be entered into with a view to enable public to abstain from bribing or any corrupt practice in order to secure the award by providing assurance to them that their competitors will also refrain from bribing and other corrupt practice and the decision makers will commit to prevent corruption, in any form, by their officials by following transparent procedures. This will also ensure a global acceptance of the decision making process adopted by DST.

Definition of Conflict of Interest:

Conflict of Interest means "any interest which could significantly prejudice an individual's objectivity in the decision making process, thereby creating an unfair competitive advantage for the individual or to the organization which he/she represents". The Conflict of Interest also encompasses situations where an individual, in contravention to the accepted norms and ethics, could exploit his/her obligatory duties for personal benefits.

1. **Coverage of the Policy:**

a) The provisions of the policy shall be followed by persons applying for and receiving funding from DST, Reviewers of the proposal and Members of Expert Committees and Programme Advisory Committees. The provisions of the policy will also be applicable on all individuals including Officers of DST connected directly or indirectly or through intermediaries and Committees involved in evaluation of proposals and subsequent decision making process.

b) This policy aims to minimize aspects that may constitute actual Conflict of Interests, apparent Conflict of Interests and potential Conflict of Interests in the funding mechanisms that are presently being operated by DST. The policy also aims to cover, although not limited to, Conflict of interests that are Financial (gains from the outcomes of the proposal or award), Personal (association of relative / Family members) and Institutional (Colleagues, Collaborators, Employer, persons associated in a professional career of an individual such as Ph.D. supervisor etc.)

2. **Specifications as to what constitutes Conflict of Interest.**

Any of the following specifications (non-exhaustive list) imply Conflict of Interest if,

(i) Due to any reason by which the Reviewer/Committee Member cannot deliver fair and objective assessment of the proposal.

(ii) The applicant is a directly relative# or family member (including but not limited to spouse, child, sibling, parent) or personal friend of the individual involved in the decision making process or alternatively, if any relative of an Officer directly involved in any decision making process / has influenced interest/ stake in the applicant's form etc..

(iii) The applicant for the grant/award is an employee or employer of an individual involved in the process as a Reviewer or Committee Member; or if the applicant to the grant/award has had an employer-employee relationship in the past three years with that individual.

(iv) The applicant to the grant/award belongs to the same Department as that of the Reviewer/Committee Member.

(v) The Reviewer/Committee Member is a Head of an Organization from where the applicant is employed.

(vi) The Reviewer /Committee Member is or was, associated in the professional career of the applicant (such as Ph.D. supervisor, Mentor, present Collaborator etc.)

(vii) The Reviewer/Committee Member is involved in the preparation of the research proposal submitted by the applicant.

(viii) The applicant has joint research publications with the Reviewer/Committee Member in the last three years.

(ix) The applicant/Reviewer/Committee Member, in contravention to the accepted norms and ethics followed in scientific research has a direct/indirect financial interest in the outcomes of the proposal.

(x) The Reviewer/Committee Member stands to gain personally should the submitted proposal be accepted or rejected.

The Term "Relative" for this purpose would be referred in section 6 of Companies Act , 1956.

3. **Regulation:**

The DST shall strive to avoid conflict of interest in its funding mechanisms to the maximum extent possible. Self-regulatory mode is however recommended for stake holders involved in scientific research and research management, on issues

pertaining to Conflict of Interest and scientific ethics. Any disclosure pertaining to the same must be made voluntarily by the applicant/Reviewer/Committee Member.

4. **Confidentiality**:

The Reviewers and the Members of the Committee shall safeguard the confidentiality of all discussions and decisions taken during the process and shall refrain from discussing the same with any applicant or a third party, unless the Committee recommends otherwise and records for doing so.

5. **Code of Conduct**

5.1 To be followed by Reviewers/Committee Members:

(a) All reviewers shall submit a conflict of interest statement, declaring the presence or absence of any form of conflict of interest.
(b) The reviewers shall refrain from evaluating the proposals if the conflict of interest is established or if it is apparent.
(c) All discussions and decisions pertaining to conflict of interest shall be recorded in the minutes of the meeting.
(d) The Chairman of the Committee shall decide on all aspects pertaining to conflict of interests.
(e) The Chairman of the Committee shall request that all members disclose if they have any conflict of interest in the items of the agenda scheduled for discussion.
(f) The Committee Members shall refrain from participating in the decision making process and leave the room with respect to the specific item where the conflict of interest is established or is apparent.
(g) If the Chairman himself/herself has conflict of interest, the Committee may choose a Chairman from among the remaining members, and the decision shall be made in consultation with Member Secretary of the Committee.
(h) It is expected that a Committee member including the Chair-person will not seek funding from a Committee in which he/she is a member. If any member applies for grant, such proposals will be evaluated separately outside the Committee in which he/she is a member.

5.2 To be followed by the Applicant to the Grant/Award:

(a) The applicant must refrain from suggesting referees with potential Conflict of Interest that may arise due to the factors mentioned in the specifications described above in Point No. 2.
(b) The applicant may mention the names of individuals to whom the submitted proposal should not be sent for refereeing, clearly indicating the reasons for the same.

5.3 To be followed by the Officers dealing with Programs in DST:

While it is mandatory for the program officers to maintain confidentiality as detailed in point no. 6 above, they should declare, in advance, if they are dealing with grant applications of a relative or family member (including but not limited to spouse, child, sibling, parent) or thesis/ post-doctoral mentor or stands to benefit financially if the applicant proposal is funded. In such cases, DST will allot the grant applications to the other program officer.

6. **Sanction for violation**

3.1 **For a) Reviewers / Committee Members and b) Applicant**

Any breach of the code of conduct will invite action as decided by the Committee.

3.2 **For Officers dealing with Program in DST**

Any breach of the code of conduct will invite action under present provision of CCS (conduct Rules), 1964.

7. **Final Appellate authority**:

Secretary, DST shall be the appellate authority in issues pertaining to conflict of interest and issues concerning the decision making process. The decision of Secretary, DST in these issues shall be final and binding.

8. **Declaration**

I have read the above "Policy on Conflict of Interest" of the DST applicable to the Reviewer/ Committee Member/ Applicant/ DST Scheme or Program Officer # and agree to abide by provisions thereof.

I hereby declare that I have no conflict of interest of any form pertaining to the proposed grant *
I hereby declare that I have conflict of interest of any form pertaining to the proposed grant *

* & # (Tick whichever is applicable)

Name of the Reviewer/ Committee Member or Applicant or DST Officer
(Strike out whichever is not applicable)

14/07/2023.
(Signature with date)

Malla Reddy Engineering College

(An UGC Autonomous Institution approved by AICTE and affiliated to JNTU Hyderabad,
Accredited by NAAC with 'A++' Grade (III - cycle)
NBA Accredited Programmes - UG (CE, EEE, ME, ECE & CSE) PG (CE - Structural Engg., EEE-Electrical Power Systems, ME - Thermal Engg.).

ENDORSEMENT FROM THE HEAD OF INSTITUTION

PROJECT TITLE: **EMPOWERING STUDENTS TO MONITOR THEIR WELL-BEING IN HEALTH, CLEANLINESS WITH IOT TECHNIQUES.**

1. Certified that the Institute welcomes participation of **Dr P Joel Josephson** as the Principal Investigator/Coordinator and **Dr. Rahul Kumar & Dr M Jagadeesh Chandra Prasad** as the Co-Investigator for the project and that in the unforeseen event of discontinuance by the Principal Investigator, the Co-Investigator will assume the responsibility for the fruitful completion of the project (after obtaining consent in advance from DST).

2. Certified that the equipment, other basic facilities and such other administrative facilities as per terms and conditions of the grant, will be extended to investigator (s) throughout the duration of the project.

3. Institute assures financial and other managerial responsibilities of the project.

4. Certified that the organization has never been blacklisted by any department of the State Government or Central Government.

Name and Signature of Head of Institution

Dr A Ramaswami Reddy
Principal
Malla Reddy Engineering College
Maisammaguda, Dhulapally,
(Post Via Kompally), Secunderabad-500100.

Date: 30/06/2023
Place: Hyderabad