JYOTHISHMATHI INSTITUTE OF TECHNOLOGY & SCIENCE (AUTONOMOUS)
Approved by AICTE, New Delhi & Affiliated to JNTUH, Hyderabad
Accredited with NAAC 'A' Grade | ISO 9001:2015 Certified
UG - CSE,ECE,EEE Accredited by National Board of Accreditation, New Delhi

Ref. No.:JITS/R&D/2023-24/01 **Date: 07.08.2023**

Circular

Subject: Submission of Research Proposals for Seed Money Grant

The Research & Development (R&D) Cell of Jyothishmathi Institute of Technology and Science (JITS) invites research proposals from faculty members under the **Seed Money Grant Policy**. This initiative aims to support innovative and interdisciplinary research projects with the potential for significant societal impact and future external funding.

Important Dates:

Last Date for Proposal Submission: 19.08.2023

Announcement of Shortlisted Pre-Proposals: 04.09.2023

Submission Guidelines:

- Use the prescribed format attached with the circular or collects it from the R&D Office.
- Incomplete submissions or those received after the deadline will not be considered.

We look forward to receiving your innovative research proposals and encourage all eligible faculty members to participate actively in this initiative.

Coordinator R&D

Jyothishmathi Institute of Technology and Science

Scanned by CamScanner

Application for Seed Money Grant

(Submit this form to the R&D through the Head of Department)

Section 1: Basic Details

1. **Title of the Proposal:** Facial Recognition in Biometric System

2. **Principal Investigator (PI):**

Name : Dr.N.Venkateswaran

Designation : Associate Professor

Department : Computer Science and engineering

Contact Number : 9440188403

Email Address: venkateswaran.n@jits.ac.in, venkywn@gmail.com

3. **Co-Investigator(s) (if any):**

Name(s) :Dr.R.Jegadeesan

Designation(s) : Professor & Head

Department(s) : Computer Science and engineering

Contact Number(s :9894493746

Email Address(es) : hod.cse@jits.ac.in

Section 2: Project Details

1. **Project Summary**

The **Face Recognized Biometric System** project aims to design and develop a robust and secure facial recognition-based authentication system to address modern identity verification challenges. Traditional methods such as passwords, PINs, and keycards are increasingly vulnerable to security breaches, theft, and misuse. This project seeks to replace or supplement these methods with a contactless, efficient, and highly secure alternative powered by advanced facial recognition technology.

The system will leverage deep learning algorithms, particularly Convolutional Neural Networks (CNNs), to extract and analyze unique facial features for accurate and reliable identification. By incorporating data

Scanned by CamScanner

encryption and compliance with privacy regulations, the project ensures that user information remains secure and protected.

The proposed solution is versatile and scalable, with potential applications in areas such as secure access control, attendance tracking, and financial transaction authentication. It is designed to operate effectively in diverse environments, addressing challenges like varying lighting conditions, facial expressions, and angles. With its ability to enhance security and user convenience, the Face Recognized Biometric System has the potential to revolutionize identity verification in both public and private sectors.

Through this project, a functional prototype will be developed and rigorously tested to ensure high accuracy, efficiency, and reliability, laying the groundwork for broader implementation and adoption in the future.

2. **Objectives of the Research:**

- Develop a reliable and user-friendly facial recognition-based biometric system.
- Ensure high accuracy in identification across diverse lighting and environmental conditions.
- Implement robust data encryption and privacy measures to secure user information.

3. **Significance and Innovation:**

This project is significant because it addresses the growing need for advanced security systems in an increasingly digital and interconnected world. By replacing or complementing traditional authentication methods, this biometric system can reduce security risks, prevent unauthorized access, and improve user convenience.

Novelty of the Research

The **Face Recognized Biometric System** stands out due to its innovative approach in addressing existing challenges in biometric authentication. The novelty of the research lies in the following aspects:

- ✓ Advanced Deep Learning Techniques
- ✓ Robust Anti-Spoofing Mechanisms
- ✓ Real-Time Processing
- ✓ Privacy-Enhancing Technology
- ✓ Adaptability to Diverse Environments

Potential Impact

- ✓ Enhanced Security
- ✓ Improved User Experience
- ✓ Applications Across Industries
- ✓ Data Privacy and Trust
- ✓ Scalability and Future Potential

Scanned by CamScanner

This research not only addresses critical gaps in current biometric systems but also sets a foundation for more secure, efficient, and privacy-conscious authentication technologies in the future.

4. **Expected Outcomes:**

- A functional prototype of a facial recognition-based biometric system.
- Deployment-ready software capable of integration with existing security infrastructure.
- Publications in peer-reviewed journals and conferences to disseminate research findings.
- Intellectual property filings, such as patents, to protect innovative aspects of the system.
- Development of external funding proposals to attract investments and expand the scope of the project.
- Enhanced academic and industry collaborations to further refine and deploy the system.

Section 3: Research Methodology

1. **Proposed Methodology:**

Problem Definition:

- Analyse the limitations of current authentication methods and the need for enhanced biometric solutions.
- Define use cases, including secure access control, transaction verification, and attendance management.

Data Collection and Preparation:

- Gather a comprehensive dataset of facial images with diverse conditions (lighting, poses, and expressions).
- Apply pre-processing techniques like image normalization, facial landmark detection, and augmentation to improve model robustness.

Model Development:

- Develop a Convolutional Neural Network (CNN)-based architecture for facial feature extraction and recognition.
- Train the model using the pre-processed dataset and fine-tune it for optimal performance, balancing accuracy and processing speed.

System Design and Integration:

- Implement core modules: face detection, feature extraction, and identity verification.
- Integrate the system into a user-friendly interface with functionalities such as user enrolment and authentication.

Security and Privacy Measures:

Scanned by CamScanner

- Employ encryption techniques to secure stored biometric data and prevent unauthorized access.
- Implement compliance measures for data privacy regulations (e.g., GDPR).

Performance Evaluation:

- Test the system in controlled and real-world environments to evaluate metrics such as recognition accuracy, response time, and robustness.
- Address challenges like false positives, false negatives, and spoofing attacks.

Deployment and Scalability:

- Deploy the system in a pilot environment for feedback and refinement.
- Scale the solution for broader deployment across different applications and industries.

2. **Interdisciplinary Collaboration (if applicable):** Not Applicable

Section 4: Budget Details

1. **Estimated Budget (in INR):**

Category	**Amount (INR)**	**Justification**
Hardware (HD Cameras, storage	45,750	To capture the facial images
Software tools	-	Azure Face API
Books/Resources	2,250	
Miscellaneous	2,000	
Total	50,000	

2. **Budget Justification** *(Maximum 200 words)*:
(Explain the necessity of the requested funds)

Section 5: Institutional Support

1. **Facilities/Infrastructure Available:**
Yes

2. **Additional Support Required (if any):**
(List any specific requirements beyond the seed money)

Scanned by CamScanner

Section 6: Declaration

I hereby declare that:

1. The information provided is true to the best of my knowledge.
2. The project complies with the policies of Jyothishmathi Institute of Technology and Science.
3. Any intellectual property generated during the project will be owned by the Institute.

Signature of Principal Investigator:
Date: 17/08/2023

Signature of Head of Department:
Date: 17/8/23

Head of the Department
Computer Science and Engineering
Jyothishmathi Institute of Technology & Science
Nustulapur, Distt Karimnagar-505 481.

Remarks by R&D Coordinator:
(For Office Use Only)

After reviewing the project proposal, the feasibility, objectives, and anticipated outcomes, I recommend and approved the proje

Signature of R&D Coordinator:
Date: 06/09/2023

Forwarded to principal

Scanned by CamScanner