IARE
INSTITUTE OF
AERONAUTICAL ENGINEERING

HIGH IMPACT PRACTICES (HIPS)

CORNERSTONE PROJECTS (CoPs)

INFORMATION PACKET

2025 - 2026

IARE
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AERONAUTICAL ENGINEERING
25 YEARS
2000 2025

I appreciate your interest in the Cornerstone Project (CoP), Department of CSE (AI & ML) at the Institute of Aeronautical Engineering!

A **cornerstone project (CoP)** is typically introduced during the early or middle stages of an academic program at the Institute of Aeronautical Engineering. It focuses on helping students build foundational skills and understand how to apply basic concepts to real-world scenarios. These projects are usually smaller in scope, moderately complex, and designed to strengthen practical understanding of core subjects.

These projects encourage students to connect theoretical learning to data-centric applications, such as developing the data learning model, performing simple data analysis, or creating prototype engineering solutions. Emphasis is placed on learning by doing, helping students build confidence in applying methods like data preprocessing, statistical analysis, basic modeling, and reporting results. By working on these projects, students begin to understand how engineering and data science principles apply in real-world scenarios. Ultimately, cornerstone projects act as the foundation of experiential learning at IARE, transitioning students from passive learners to active problem-solvers, equipped with both technical skills and professional behaviors necessary for the challenges of advanced engineering education.

Cornerstone Project (CoP) teams are:

- Collaborative Project – This is an excellent opportunity for students who are committed to working towards social developments and emerging needs.
- Project Activity – The project coordinator listed current working areas for offering cornerstone projects with a team size of at least two students. The coordinator allotted mentors based on the work area and facilitated exclusive project laboratories for selected cornerstone project (CoP)students. This cornerstone project (CoP)bridges the gap between academic learning and realworld social applications. It helps enhance the professional development.
- Short-term - Each undergraduate student may participate in a project for an assigned period.

The primary goal of cornerstone projects is to provide a level of moderate complexity, expertise, and diversity of thought in social data-centric areas that will allow them to gain hands-on experience with the cornerstone projects.

- Simulate real-world project work environments - Familiarize students with the structure, expectations, and deliverables typical of data-driven and software development projects.
- Encourage interdisciplinary thinking - Promote the application of data science methods to diverse domains such as healthcare, finance, education, environment, and smart cities.
- Promote ethical and responsible data use - Instil awareness of data ethics, privacy, security, and responsible AI practices during project planning and execution.
- Support data-driven decision making - Enable students to create data solutions that drive actionable insights, support evidence-based decisions, and add value to stakeholders.
- Foster hands-on project experience - Engage students in comprehensive, real-world data science project work that integrates the full data lifecycle from collection to insight generation and emerging technologies like AutoML, NLP, and LLMs.
- Build strong project portfolios - To enable students to create social and industry-ready project portfolios that demonstrate technical depth, innovation, and impact on careers.
- Bridge academic learning and practical application - Apply theoretical knowledge to practical challenges involving data analysis, machine learning, and visualization using real datasets.

Cornerstone Projects (CoPs) focuses on the challenges presented by the Sustainable Development Goals (SDGs)

Sustainability Development Goals (SDGs) for the Dept. of CSE (Ai&ML), IARE	
SDG #2	End hunger, achieve food security and improved nutrition and promote sustainable agriculture
SDG #3	Ensure healthy lives and promote well-being for all at all ages
SDG #4	Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all
SDG 8	Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all
SDG #10	Reduce inequality within and among countries
SDG #11	Make cities and human settlements inclusive, safe, resilient and sustainable
SDG #13	Take urgent action to combat climate change and its impacts
SDG #16	Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels

Themes of Cornerstone Projects (CoPs) for the CSE (AI & ML):

The following project domains are recommended for cornerstone projects (CoPs), and the students should frame the problem statements from any one of the following themes:

1). AI-Driven Education Platforms and Smart Learning Systems (SDG #4)
2). AI-Driven Healthcare and Well-being Systems (SDG #3)
3). Smart Agriculture and Food Security Systems (SDG #2)
4). Smart Cities and Urban Development (SDG #11)
5). Cybersecurity and Threat Intelligence (SDG #16)
6). Data-Driven Decision Support Systems for Finance and Business (SDG #8)
7). Environment and Sustainability (SDG #13)
8). Assistive Technology and AI Solutions for Inclusive Participation (SDG #10)

In order to participate in cornerstone projects, you must formally apply and be accepted by the project coordinator. To proceed, please mail to the project coordinator, Dr. M Purushotham Reddy (dr.purushothamreddy@iare.ac.in), Head of CSE (AI & ML). This will bring up all available open positions tagged as cornerstone projects.
Please note that participation by the cornerstone project (CoP) team requires registration for the accompanying project work from any of the specified domains. More information will be provided to all selected cornerstone project (CoP) applicants who have been offered a position.

If you have any questions about a particular team, please contact the faculty mentor.
We encourage you to contemplate this fascinating new opportunity. We look forward to receiving your application submission!

AI-Driven Education Platforms and Smart Learning Systems

Dr. M Purushotham Reddy, Professor & Head, Department of CSE (AI&ML) - Faculty Mentor

GOALS

To develop a smart, personalized, and inclusive learning ecosystem that leverages AI and digital tools to enhance education outcomes. The project will focus on creating adaptive learning platforms that cater to diverse student needs and learning styles, with the aim of improving engagement, retention, and academic performance.

The system will incorporate AI-driven analytics to evaluate student performance and provide real-time feedback, automated content recommendation, and intelligent tutoring support. The project aims to bridge gaps in access to quality education and enable continuous learning beyond the classroom.

By leveraging emerging technologies like Natural Language Processing, Computer Vision, and Knowledge Graphs, the platform will support multiple modes of interaction including voice, video, and textual input, making learning more accessible and engaging.

This initiative will benefit students, teachers, and educational institutions by providing scalable and affordable solutions for personalized education, intelligent content delivery, and improved academic planning.

METHODS & TECHNOLOGIES

Cornerstone Project (CoP) team will focus on AI-Driven Education Platforms and Smart Learning Systems

- Adaptive Learning Algorithms – AI models that adjust content delivery based on learner pace and understanding
- Natural Language Processing (NLP) – Intelligent chatbots and voice assistants for real-time tutoring and query solving
- Learning Analytics – Data-driven evaluation of student performance using dashboards and visual analytics
- Gamification Techniques – Enhancing motivation through rewards, levels, and learning missions
- Computer Vision – Automated evaluation of handwritten assignments and facial emotion detection for engagement tracking
- Cloud-Based Learning Management Systems (LMS) – Scalable, multi-user platforms like Moodle or Google Classroom
- Augmented & Virtual Reality (AR/VR) – Immersive experiences for STEM and skill-based learning modules
- Knowledge Graphs – Mapping subject knowledge for curriculum-wide intelligent content recommendation

RESEARCH, DESIGN, & TECHNICAL ISSUES

Cornerstone Project (CoP) team should be interested in the following areas of focus: Enhancing Education through Smart Technologies

- Designing user-centric interfaces for various education levels (K-12, UG, PG)
- Ensuring adaptability across multiple devices and low-bandwidth environments
- Securing student data privacy and compliance with data protection policies

- Developing multilingual support for inclusive education
- Creating robust assessment models for competency-based learning
- Integrating content from open educational resources and standard curriculum
- Addressing bias in AI models and ensuring equitable learning opportunities
- Building scalable microservices for content delivery and analytics

MAJORS & AREAS OF INTEREST

Cornerstone Project (CoP) team may include students from the following majors or areas of interest:

- Artificial Intelligence & Machine Learning – Adaptive models and intelligent agents
- Educational Technology – Smart content delivery and e-learning platforms
- Human-Computer Interaction – Designing accessible and intuitive user interfaces
- Data Science & Visualization – Student analytics and performance modeling
- Natural Language Processing – Conversational agents and reading comprehension tools
- Cloud Computing – Scalable education infrastructure and SaaS tools
- Software Engineering – Learning platforms and automation of academic tasks
- Cognitive Science – Understanding learning behaviors and cognitive models

MENTOR CONTACT INFORMATION

Dr. M Purushotham Reddy
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PARTNERS & SPONSORS

None

AI-Driven Healthcare and Well-being Systems

Dr Sk Jakeer Hussain, Associate Professor, CSE(AI&ML)_ Faculty Mentor

GOALS

To develop intelligent systems for enhancing healthcare access, monitoring, and diagnostics through AI and IoT. The project aims to build affordable and accurate solutions for preventive care, remote monitoring, and personalized treatment recommendations.

The primary objective is to improve healthcare outcomes by utilizing predictive models for disease detection, continuous health tracking using wearable sensors, and decision support systems for clinicians. the system will also assist in detecting early signs of chronic illnesses such as diabetes, hypertension, and cardiovascular-issues.

This initiative will benefit both urban and rural populations by reducing the burden on healthcare infrastructure, enabling telemedicine, and encouraging patient self-care through mobile health technologies.

METHODS & TECHNOLOGIES

Cornerstone Project (CoP) team will focus on Smart and AI-Based Healthcare Monitoring and Wellness Systems

- Wearable Health Devices – Real-time collection of heart rate, BP, glucose, and oxygen levels
- Machine Learning Models – Predictive diagnosis and anomaly detection from medical records
- Internet of Medical Things (IoMT) – Integration of smart health devices with cloud platforms
- Deep Learning – CNNs and RNNs for medical image and ECG signal analysis
- Mobile App Development – For health tracking, alerts, and teleconsultation interfaces
- Cloud & Edge Computing – Secure data storage and faster processing of health metrics
- Natural Language Processing – Virtual health assistants and symptom checkers
- Data Visualization – Dashboards for doctors and patients for actionable insights

RESEARCH, DESIGN, & TECHNICAL ISSUES

Cornerstone Project (CoP) team should be interested in the following critical issues in Digital Healthcare Innovation

- Ensuring data privacy and compliance with medical data regulations (HIPAA, GDPR)
- Reducing false positives/negatives in disease prediction models
- Creating adaptive systems for various age groups and comorbidities
- Handling missing, noisy, or irregular health data from sensors
- Designing accessible and multilingual patient interfaces
- Building trust and explainability into AI-driven decisions
- Managing edge cases and emergency response protocols
- Integrating with hospital information systems (HIS)

MAJORS & AREAS OF INTEREST

Cornerstone Project (CoP) team may include students from the following domains or interests:

- Biomedical Engineering – Sensor integration and medical device interfacing
- Artificial Intelligence & Machine Learning – Predictive healthcare models
- Data Science – Health analytics and risk stratification
- Internet of Things – Smart health monitoring infrastructure
- Cloud & Mobile Computing – Secure and portable health solutions
- Human-Centered Design – Patient-centric interfaces and usability testing
- Cybersecurity – Secure handling of sensitive patient data
- Embedded Systems – Low-power devices for wearable tech

MENTOR CONTACT INFORMATION

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PARTNERS & SPONSORS

None

Smart Agriculture and Food Security Systems

Dr B Padmaja, Associate Professor, CSE(AI&ML)_ Faculty Mentor

GOALS

To develop AI- and IoT-driven solutions to enhance productivity, resource efficiency, and sustainability in agriculture while ensuring food security. The project aims to monitor crop health, soil conditions, and environmental factors using smart sensors, satellite imagery, and predictive analytics.

The system will help optimize irrigation, fertilizer usage, and pest control by delivering real-time insights to farmers. It will also support post-harvest processes such as supply chain optimization, storage monitoring, and food distribution.

This initiative aims to benefit farmers, agricultural scientists, and policymakers by making farming smarter, sustainable, and resilient to climate change and global food supply challenges.

METHODS & TECHNOLOGIES

Cornerstone Project (CoP) team will focus on AI and IoT Applications for Smart Agriculture and Food Systems

- IoT Sensors – Monitoring soil moisture, temperature, humidity, and nutrient levels
- Remote Sensing – Use of drones and satellite imagery for field analysis
- Machine Learning Models – Predicting crop yield, disease outbreaks, and weather patterns
- Geographic Information Systems (GIS) – Mapping farm plots and tracking crop health
- Cloud-based Dashboards – Real-time visualization of farm metrics and alerts
- Mobile Apps – Farmer advisory services and crop management support
- Blockchain – Ensuring food traceability and secure supply chain management
- Computer Vision – Automated pest and weed detection using image processing

RESEARCH, DESIGN, & TECHNICAL ISSUES

Cornerstone Project (CoP) team should be interested in the following challenges in Smart Agriculture Innovation

- Designing low-cost and scalable IoT sensor networks for rural areas
- Handling inconsistent or missing data from field devices
- Ensuring real-time communication and low latency in remote regions
- Developing multilingual interfaces for farmer usability
- Building robust models for varying crop types and climate zones
- Protecting data privacy and access control in agricultural systems
- Integrating AI predictions with human decision-making processes
- Maintaining system reliability in harsh field conditions

MAJORS & AREAS OF INTEREST

Cornerstone Project (CoP) team may include students from the following domains or interests:

- Agricultural Technology – Precision farming and smart irrigation
- Artificial Intelligence & Machine Learning – Forecasting and decision support
- Internet of Things – Sensor networks and device integration
- Data Science & Analytics – Yield estimation and risk modeling
- Environmental Science – Sustainable agriculture and climate resilience
- Embedded Systems – Designing energy-efficient edge devices
- Mobile Computing – Farmer advisory tools and apps
- Supply Chain Management – Post-harvest storage and logistics optimization

MENTOR CONTACT INFORMATION

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PARTNERS & SPONSORS

None

Smart Cities and Urban Development

Dr M Nagaraju, Assistant Professor, CSE(AI&ML)_ Faculty Mentor

GOALS

To design and implement intelligent urban systems that support sustainable, efficient, and citizen-friendly city management. This project focuses on integrating digital technologies like IoT, AI, and big data into infrastructure and public services to enhance urban living, improve governance, and support real-time decision-making.

The objective is to develop smart solutions for urban challenges such as traffic congestion, energy management, waste disposal, public safety, and urban planning. The system will empower administrators with intelligent insights while also involving citizens through participatory platforms.

This initiative will benefit municipal corporations, planners, and citizens by promoting sustainability, transparency, and innovation in urban development.

METHODS & TECHNOLOGIES

Cornerstone Project (CoP) team will focus on Digital Infrastructure and AI-based Urban Innovation Systems

- IoT and Sensor Networks – Real-time monitoring of traffic, air quality, and utilities
- Urban Mobility Platforms – Smart parking, EV charging, and public transport integration
- AI & Data Analytics – Predictive modeling for resource allocation and emergency response
- Geographic Information Systems (GIS) – Spatial analysis for urban growth and land use planning
- Smart Grids – Energy-efficient management of power and utilities
- Cloud and Edge Computing – Scalable infrastructure for urban applications
- Citizen Feedback Systems – Apps and portals for public engagement and reporting
- Digital Twins – Virtual replicas of cities for simulation and planning

RESEARCH, DESIGN, & TECHNICAL ISSUES

Cornerstone Project (CoP) team should be interested in the following interdisciplinary challenges in Smart Urban Innovation

- Interoperability between legacy systems and smart infrastructure
- Ensuring real-time data availability and system responsiveness
- Securing personal and municipal data against cyber threats
- Addressing privacy concerns in surveillance and data collection
- Designing scalable platforms adaptable to different city sizes
- Managing heterogeneous data sources across multiple domains
- Promoting digital literacy and inclusivity among citizens
- Coordinating across government departments and private partners

MAJORS & AREAS OF INTEREST

Cornerstone Project (CoP) team may include students from the following domains or interests:

- Artificial Intelligence & Machine Learning – Smart city data intelligence
- Internet of Things – Sensor networks and infrastructure automation
- Data Science – Urban analytics and pattern detection
- Environmental Engineering – Air, water, and waste management
- Urban Planning & Civil Engineering – Infrastructure design and city modeling
- Cybersecurity – Protection of urban data and services
- Human-Computer Interaction – Designing public-facing applications
- Cloud Computing – Scalable and secure urban platforms

MENTOR CONTACT INFORMATION

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PARTNERS & SPONSORS

None

Cybersecurity and Threat Intelligence

Dr. M Purushotham Reddy, Professor & Head, Department of CSE (AI&ML) - Faculty Mentor

GOALS

To build intelligent cybersecurity frameworks that proactively detect, prevent, and respond to cyber threats across digital environments. The project will develop threat intelligence platforms capable of analyzing real-time data from networks, endpoints, and user behavior.

The key objective is to protect critical information infrastructure by leveraging AI for anomaly detection, malware classification, intrusion prevention, and automated threat response. The project also focuses on building threat-sharing ecosystems to enhance situational awareness and coordinated defense.

This initiative will benefit enterprises, government systems, and individuals by improving security posture, reducing response times, and fostering proactive cyber defense strategies.

METHODS & TECHNOLOGIES

Cornerstone Project (CoP) team will focus on AI-Driven Security Monitoring and Threat Detection Systems

- Network Traffic Analysis – Deep Packet Inspection and anomaly detection
- Machine Learning – Behavioral analysis and threat classification models
- Cyber Threat Intelligence (CTI) – Collection and correlation of global threat indicators
- SIEM Platforms – Security Information and Event Management tools integration
- Malware Analysis – Static and dynamic analysis using sandbox environments
- Honeypots and Deception Systems – Identifying intruders through traps
- Blockchain – Secure authentication and data integrity in cyber systems
- Threat Hunting Tools – MITRE ATT&CK-based detection frameworks

RESEARCH, DESIGN, & TECHNICAL ISSUES

Cornerstone Project (CoP) team should be interested in the following core issues in Cybersecurity and Threat Intelligence Innovation

- Ensuring timely detection of sophisticated zero-day threats
- Handling encrypted traffic without compromising privacy
- Reducing false alarms in automated security systems
- Designing adaptive models to counter evolving attack vectors
- Securing distributed systems and remote endpoints
- Building real-time dashboards for SOC operations
- Implementing secure APIs and authentication layers
- Conducting forensic investigations post-incident

MAJORS & AREAS OF INTEREST

Cornerstone Project (CoP) team may include students from the following domains or interests:

- Cybersecurity & Ethical Hacking – Penetration testing and exploit detection
- Artificial Intelligence & Machine Learning – Anomaly detection and cyber intelligence
- Network Engineering – Traffic monitoring and secure protocols
- Data Science – Threat modeling and behavior profiling
- Digital Forensics – Investigating cybercrimes and malware analysis
- Software Security – Secure development and code auditing
- Blockchain & Cryptography – Secure data transmission and authentication
- Cloud Security – Protecting virtual environments and containers

MENTOR CONTACT INFORMATION

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PARTNERS & SPONSORS

None

Data-Driven Decision Support Systems for Finance and Business

Dr P Ashok Babu, Professor, CSE(AI&ML)__ Faculty Mentor

GOALS

To build intelligent systems that drive financial decision-making, risk assessment, and market trend forecasting using data analytics and machine learning. This project aims to automate and optimize financial operations, detect anomalies, and provide actionable insights to stakeholders.

The core objective is to enhance the financial intelligence infrastructure of businesses by integrating real-time data sources and predictive models that support strategic planning, fraud detection, customer segmentation, and investment analysis.

This initiative will benefit organizations, analysts, and financial institutions by improving data-driven decisions, reducing financial risk, and optimizing operations across domains such as banking, retail, and enterprise management.

METHODS & TECHNOLOGIES

Cornerstone Project (CoP) team will focus on Data-Driven Decision Support Systems for Finance and Business

- Financial Forecasting Models – Time series and regression models for revenue, expense, and market trends
- Business Intelligence Tools – Tableau, Power BI, and Looker for visualization and executive dashboards
- Machine Learning Algorithms – Classification and clustering for fraud detection, credit scoring, and churn prediction
- Natural Language Processing (NLP) – Sentiment analysis on financial news and investor feedback
- RPA (Robotic Process Automation) – Automating repetitive financial tasks such as invoice processing and reconciliation
- Blockchain – Enhancing transparency in transactions and secure audit trails
- Cloud Computing Platforms – AWS, Azure for data lakes, scalability, and compliance
- Data Warehousing – Consolidation and ETL of structured/unstructured financial data

RESEARCH, DESIGN, & TECHNICAL ISSUES

Cornerstone Project (CoP) team should be interested in the following key issues in Financial and Business Analytics Innovation

- Modeling uncertain and volatile financial environments
- Detecting and mitigating financial fraud using historical and real-time patterns
- Ensuring data accuracy, traceability, and auditability in reporting systems
- Designing user-friendly dashboards for executive-level decision-making
- Adapting models to regulatory requirements across global financial jurisdictions
- Addressing bias and ethical concerns in automated credit and loan systems
- Managing real-time streaming financial data with low latency
- Securing financial information and complying with standards such as PCI-DSS and SOX

MAJORS & AREAS OF INTEREST

Cornerstone Project (CoP) team may include students from the following domains or interests:

- Data Science & Analytics – Predictive analytics and financial modeling
- Finance & Accounting – Budgeting, forecasting, compliance, and auditing
- Artificial Intelligence & Machine Learning – Intelligent decision-making models
- Information Systems – BI implementation and dashboard design
- Cloud & DevOps – Data pipelines and secure, scalable deployments
- Cybersecurity – Secure financial systems and fraud detection
- Business Management – Strategic planning and operations intelligence
- Software Engineering – Automation and backend systems for financial applications

MENTOR CONTACT INFORMATION

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PARTNERS & SPONSORS

None

Environment and Sustainability

Dr M Nagaraju, Assistant Professor, CSE (AI&ML)_ Faculty Mentor

GOALS

To design intelligent environmental monitoring and sustainability management systems that utilize digital technologies like IoT, AI, and remote sensing for proactive environmental protection. The project aims to track, predict, and mitigate environmental degradation through data-driven insights.

The objective is to develop platforms for air and water quality monitoring, waste management, carbon footprint analysis, and ecosystem conservation. This includes real-time alerts for environmental anomalies, prediction of pollution trends, and optimization of resource consumption.

This initiative will support policy-makers, environmentalists, and urban planners in creating a greener and more sustainable future through measurable and transparent environmental intelligence.

METHODS & TECHNOLOGIES

Cornerstone Project (CoP) team will focus on AI and IoT-based Environmental Monitoring and Sustainability Platforms

- IoT-based Sensor Networks – Air and water quality sensors, noise pollution detectors
- Remote Sensing and GIS – Satellite and drone-based environmental mapping
- Machine Learning Models – Predicting pollution levels, deforestation patterns, and climate anomalies
- Carbon Tracking Systems – CO_2 footprint estimation for individuals, industries, and cities
- Waste Management Optimization – Smart bins, route optimization, and recycling monitoring
- Real-time Dashboards – Visualization of environmental KPIs for authorities and citizens
- Crowdsourcing and Mobile Apps – Citizen reporting and participation in environmental conservation
- Cloud and Edge Computing – Data storage, real-time alerts, and low-power processing for rural deployment

RESEARCH, DESIGN, & TECHNICAL ISSUES

Cornerstone Project (CoP) team should be interested in the following technical and policy challenges in Environmental Informatics

- Calibrating sensors for accurate detection in diverse climates
- Designing low-cost, solar-powered IoT devices for rural and remote locations
- Managing large-scale heterogeneous environmental datasets
- Addressing false positives in environmental anomaly detection
- Building interfaces that support multilingual and inclusive reporting
- Ensuring system scalability across geographies and population densities
- Securing environmental data and aligning with sustainability regulations
- Integrating environmental data with national open data portals and UN SDG metrics

MAJORS & AREAS OF INTEREST

Cornerstone Project (CoP) team may include students from the following domains or interests:

- Environmental Engineering – Climate science, pollution monitoring, sustainability practices
- Artificial Intelligence & Machine Learning – Predictive environmental modeling
- Internet of Things – Sensor development, low-power devices, and network integration
- Data Science & Visualization – Trend analysis and green dashboards
- Remote Sensing & GIS – Land use classification and environmental surveillance
- Embedded Systems – Field deployment of autonomous sensors and actuators
- Urban Planning – Green infrastructure, sustainable cities, and eco-zoning
- Cloud & Software Engineering – Distributed systems for real-time environmental data pipelines

MENTOR CONTACT INFORMATION

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PARTNERS & SPONSORS

None

Assistive Technology and AI Solutions for Inclusive Participation

Dr D Khalandar Basha, Assistant Professor, CSE (AI&ML)_ Faculty Mentor

GOALS

To develop inclusive technologies that remove digital, physical, and social barriers for individuals with disabilities and marginalized communities. The project focuses on leveraging AI, assistive technologies, and human-centered design to create accessible environments in education, employment, public services, and online platforms.

The core objective is to ensure equitable access to information, communication, and opportunities by developing intelligent tools for speech-to-text, sign language recognition, screen readers, mobility support, and inclusive learning platforms.

This initiative will empower persons with disabilities, elderly populations, rural users, and linguistically diverse groups, contributing to a more just and accessible society in line with UN Sustainable Development Goals (SDG 10: Reduced Inequalities).

METHODS & TECHNOLOGIES

Cornerstone Project (CoP) team will focus on Assistive Technology and AI Solutions for Inclusive Participation

- Natural Language Processing – Real-time captioning, text simplification, and translation
- Computer Vision – Sign language recognition, object detection for the visually impaired
- Speech Processing – Voice-to-text and text-to-speech systems for accessible interaction
- HCI & UX Design – User interfaces optimized for screen readers, large fonts, and color contrast
- IoT Devices – Smart wearables and mobility assistance (e.g., smart canes, haptic feedback devices)
- Inclusive Education Platforms – Learning tools for neurodiverse learners and differently-abled students
- Crowdsourcing Accessibility Feedback – Community-led improvements to apps and spaces
- Augmented Reality (AR) – Navigational and situational assistance for indoor/outdoor environments

RESEARCH, DESIGN, & TECHNICAL ISSUES

Cornerstone Project (CoP) team should be interested in the following human-centric challenges in Accessibility and Inclusion

- Designing for multi-modal interaction (voice, gesture, text)
- Ensuring compatibility with assistive hardware (e.g., Braille displays, hearing aids)
- Personalizing accessibility features based on user profile and context
- Addressing challenges in rural/low-bandwidth accessibility
- Building ethical and inclusive AI models free from cultural and linguistic bias
- Ensuring compliance with accessibility standards (WCAG, ADA, BIS guidelines)
- Collecting and annotating inclusive datasets while preserving dignity and privacy
- Testing solutions across diverse user groups and feedback cycles

MAJORS & AREAS OF INTEREST

Cornerstone Project (CoP) team may include students from the following domains or interests:

- Human-Computer Interaction – Accessible design and usability testing
- Artificial Intelligence & NLP – Voice, language, and assistive interaction systems
- Inclusive Education Technology – Adaptive learning and personalized support tools
- Software Engineering – Development of accessible web and mobile applications
- IoT & Embedded Systems – Assistive and smart devices for inclusion
- Social Innovation – Community-focused, ethical tech solutions
- UX/UI Design – Visual and interaction design for diverse user needs
- Digital Humanities – Cultural and linguistic accessibility research

MENTOR CONTACT INFORMATION

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PARTNERS & SPONSORS

None