Research Brochure

Overview

IIIT-B has state-of-the-art infrastructure including well-equipped classrooms, laboratories, and research facilities.The institute collaborates with industry and other research organisations to contribute to technological advancements. It encourages industry internships and collaborations to provide students with real-world exposure and opportunities.

Learn more about IIIT-BANGALORE 🔗

CSE / Data Science Research & Labs

E-Healthcare Research Center (EHRC) 🔗

- Brain Health Initiative (BHI).
- Mental Health Assistance Tele Mental Health Assistance and Networking Across States (Tele-MANAS)
- Karnataka Mental Health Management System (E-MANAS)
- Clinical Decision Support Solution (CDSS)
- Practice of Use Self Help for Depression (PUSH-D)
- Cranial Neuro-Navigation for Robotic Surgery

Multimodal Perception Lab 🔗

- Facial Gesture and Behaviour Analysis with Generative AI
- Multimodal Assessment towards Healthcare Domain
- Multimodal Embodied Conversational Agents
- Multimodal LLMs

Graphic Visualization Computing Lab 🔗

- LIDAR point cloud analytics and visualization
- Human brain functional connectivity community detection
- Population survey data visual and statistical analytics
- Chart data extraction and visual analytics
- Automated data extraction and text summarization of charts from images
- Natural hazard risk assessment and data analysis

Web Science Lab 🔗

- Big Data Analytics for Policy Support.
- Large scale retrieval models for multi-sensor data search.
- Characterizes the problem of consent management in data trusts and proposes
- Creating a mechanism to locate a learner in the learning space.

FSL & Image Segmentation Lab

- Few Shot Segmentation
- Generalized Few shot Segmentation
- Self Supervision Learning for Image Segmentation
- Visual Question Answering with Scene-Text
- Learning Visual Grounding in 3D Scenes
- Enhancing visual odometry with panoptic segmentation

Software Engineering and Analysis Lab 🔗

- Formal verification and testing of various applications.
- Automated application processing.

Speech Research Group 🔗

- End-to-end Automatic Speech Recognition (E2E ASR).
- Few-shot learning (FSL).
- Self-supervised Learning (SSL).
- Cross-domain E2E ASR, Accented-ASR, ASR by Analysis-by-Synthesis paradigm.
- Auto-associative memory formulations.

Scalable Data Science (ScaDS) Lab 🔗

- Streaming data Processing.
- Data Anonymization.
- Explainable AI Systems using KG embeddings.

Modular Open Source Identity Platform 🔗

- Migration of Open Source Microservices
- Selective disclosure of JSON Web Token (JWT)

ECE Research & Labs

VLSI Architecture Design Lab 🔗

- Approximate Computing (Based Accelerator)
- Hardware Accelerator for Digital Signal Processing
- Hardware Security
- Systolic Array Architectures
- POSIT based Circuits and Systems
- AI / ML Accelerator
- Neuromorphic Computing

Analog VLSI Design

- Design of Low Current, Low Noise and High PSRR LDO
- Buck and Boost converter
- Voltage reference models
- RF energy harvesting

Connected Devices and Wearables Lab 🔗

- Wearables for Internet of Things
- Ultra-Low Power and Secure Communication
- Hardware Security for Wearable Devices

CEEMS Lab 🔗

- AI/ML based Systolic accelerator on FPGA
- FPGA based Hardware-Software Co-design Accelerators
- Hardware-Algorithm co design and optimization
- HLS Tool exploration and Design Space Exploration
- BFloat and Floating-Point Unit Circuit design, Optimization and Verification
- Frequency and Power Analysis of FPGA based circuit implementation

Advanced Wireless Communications Lab 🔗

- Physical Layer Security
- Channel Estimation
- Beam Training and Tracking
- Intelligent Reflecting Surfaces
- Energy Harvesting in MIMO Networks
- Sensing and Localization

IIIT-B COMET Foundation 🔗

- Prototype of IRS and Phase optimization
- Developing 5G Base Station using O-RAN
- UAV/Drone Communication
- Radar for Drone Detection and Routing

PHYSICS AND IT SOCIETY

Centre for Complex Systems & Soft Matter Physics

- Dynamical Systems Theory
- Complex Systems and Soft Matter Physics.
- Physics of sensory systems and aspects of Earth System Dynamics.
- Quantum Computation.

Centre for IT and Public Policy

- Conduct research to ensure that design and policy choices.
- Engagement with governments and other organisations

Past Recruiters

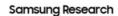Adobe Research · IBM Research · BOSCH · Schneider Electric · Microsoft Research

Industry / Academia Collaborations

Meta · SONY · Berkeley University of California · Microsoft · IBM · SIEMENS

Openstream.ai · Indian Institute of Science · intel · Government of Karnataka · DRDO · Samsung Research · TEXAS The University of Texas at Austin

TOSHIBA · Royal Academy of Engineering · Micron · Continental Automotive Systems · Infineon · IUDX India Urban Data Exchange

Recent Publications

ESOP · CAS · IEEE Transactions on Wireless Communications · IEEE GRSS · IEEE WCNC

Springer · nature International journal of science · CGVC · ELSEVIER · ICCD IEEE International Conference on Computer Design

Higher Education and Research Universities

ETH zürich · FACHHOCHSCHULE KÄRNTEN · THE HONG KONG UNIVERSITY OF SCIENCE AND TECHNOLOGY · NUS National University of Singapore

ROOSEVELT UNIVERSITY · UT DALLAS · University at Buffalo The State University of New York · UNIVERSITY OF TWENTE. · UNIVERSITY OF WATERLOO

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