Department of Computational and Data Sciences (CDS)

Indian Institute of Science, Bengaluru

Department Highlights

The Department of Computational and Data Sciences (CDS) is an interdisciplinary engineering department at the Indian Institute of Science focused on computational science, data science, and scalable systems. The research labs in the department broadly belong to the following two streams.

Computational Science and Engineering Stream: Focuses on developing computational methods and applying them to science and engineering problems. Research areas include numerical methods, scientific computing, computational biology, fluid and materials modeling, medical and multi-modal imaging, quantum computing, control and optimization, high-performance computing, and AI for science and engineering.

Computer and Data Systems Stream: Focuses on the design and analysis of high-performance and scalable computing systems. Research areas include systems for machine learning, parallel and distributed systems, edge and cloud computing, big data platforms, databases, machine learning, computer vision, natural language processing, large language models, and middleware systems.

Research Highlights

- A novel divide-and-conquer model of parallelism for fast training of DL (Deep Learning) models.
- Carpal Tunnel Syndrome Management with Artificial Intelligence based Ultrasound Imaging of Median Nerve (Youtube Link) in Collaboration with Aster-CMI Hospital, Bangalore
- A new study using genomics by Biomolecular Computation Lab has shed light on the stem cell like character of cells in the relapse and progression of oral cancer
- A novel nuclear norm-based regularizer proposed by Vision and AI Lab to improve the efficiency and effectiveness of Adversarial training.
- XFaaS platform for agentic workflow orchestration on hybrid clouds developed by DREAM:Lab and IBM Research for cross-platform scaling.
- An accurate algorithm with high-scaling ability to reconstruct complete human genomes (6 billion characters) has been developed in the ATCG lab. This algorithm has been further tested and adopted by industry.
- A new subspace iteration-based eigensolver tolerant to inexact matrix-vector multiplications has been developed by the MATRIX lab. The algorithm can harness the increasingly low precision modern AI accelerators.
- Fast and scalable computational algorithms that demonstrated a paradigm shift in large-scale quantum-mechanical calculations that are significantly faster than state-of-the art has been developed in the MATRIX lab.
- Research at CDS has contributed to over 1500 publications in top journals and A* AI/ML Conferences, with over 65,000 citations.
- Active collaborations with leading industry partners such as Google Research, Microsoft Research, Intel, Strand Life Sciences, Shell, Siemens Healthineers, GE Healthcare etc., including hosting the IBM-IISc Center of Excellence in Hybrid Clouds and NPCI-IISc Center of Excellence on Deep Tech.

Competitive Fellowships Won by CDS Students

Our students have been selected for highly competitive fellowships, including PMRF Fellowship (12 PhD Students), Google Research fellowships, Qualcomm Innovation fellowships, Intel PhD Fellowship, Reliance Foundation fellowship, Axis Bank fellowships, ACM/UPE Scholarship.

Student Awards

- Best presentation awards at IISc EECS Students Research Symposia
- Best Poster awards at several conferences, symposia and workshops, including IISc Medical Image Computing Workshop, IEEE High Performance Computing (HiPC) conference, IGHASC Workshop, CDS Alumni Outreach Event
- Best Paper award at IEEE High Performance Computing (HiPC) conference
- SIAM travel grants for showcasing PhD research work at Computational Science and Engineering Conference in Netherlands, Amsterdam
- IEEE TCHPC Travel Award for attending SC and IPDPS conferences in USA
- MICCAI Travel award for attending MICCAI conference in South Korea.
- Merit medals such as Motorola medal, NetApp medal
- Best student paper award at prestigious conferences and workshops, including British Machine Vision Conference, STEERS 2021 workshop, IEEE Cloud computing for Emerging Markets, SPCOM 2018
- IUPRAI (Indian Unit of Pattern Recognition and Artificial Intelligence) best dissertation award for the thesis titled “Deep Visual Representations: A study on Augmentation, Visualization, and Robustness” from Vision and AI Lab.
- IKDD Doctoral Dissertation Award in Data Science award and IUPRAI best dissertation award for thesis titled “Learning from Limited and imperfect data”, “Efficient and Effective Algorithms for Improving the Robustness of Deep Neural Networks”
- Won hackathons and Challenges such as National HPC Hackathon 2021, Genomics Hackathon, IEEE TCSC SCALE Challenge 2019

Faculty Achievements

- NERSC HPC Achievement Award, IA Welcome Trust DBT Fellowship: Prof. Chirag Jain
- Shri Pralhad P. Chhabria Awards 2025 Best Early Career Women Professional, IA Welcome Trust DBT Fellowship: Prof. Vaanathi Sundaresan
- IEEE TCSC Award for Excellence 2020, ACM Distinguished Member 2021, IEEE Computer Society Distinguished Contributor 2021 and Swarna Jayanti Fellowship 2019-24: Prof. Yogesh Simmhan
- ACM Gordon Bell Prize 2023, Google India Research Award 2023, Dr A P J Abdul Kalam HPC Award 2025: Prof. Phani Motamarri
- SERB-STAR (Science and Technology Award for Research), Prof. Satish Dhawan Young Engineers State Award 2019; AAAI Senior Member, 2023; ACM Distinguished Member 2024; Fellow of INAE-2025, Prof. Rustum Choksi Award for Excellence in Research in Engineering-2025: Prof. R. Venkatesh Babu
- AI2050 Early Career Fellowship: Prof. Danish Pruthi
- President, ACM India (2020-2022): Prof. Jayant Haritsa
- Dr. APJ Abdul Kalam HPC Award 2025: Prof. Konduri Aditya
- IISc Award for Excellence in Teaching 2022: Prof. Deepak Subramani

Placements in Industry and Academia

- Recent graduates have joined Industry positions at Google Deepmind, Facebook-Meta, AMD, Intel, Microsoft Research, Shell, Qualcomm, Bosch, GE Healthcare, Philips Innovation, Wells Fargo, Siemens Technology, Samsung Research, IBM-IRL, Cerebras, Fujitsu Research etc.
- Recent graduates are pursuing their Postdocs at prestigious universities like John Hopkins University, University College London, University of Chicago, Okinawa Institute of Science and Technology (OIST), INRIA (France) and Heidelberg University.
- Some of the recent graduates obtained faculty positions at IISc Bangalore, the University of Amsterdam, California State University, IIT Hyderabad, IIT Roorkee, IIT Guwahati, IIIT Hyderabad and NITs.

Research Admissions Interview Procedure

Ph.D. and M.Tech. (Research), Aug 2026 Cycle

Overview

Applicants *shortlisted* based on their online application form GATE/NET scores, ME/MTech/CFTI CGPA, etc. will receive an email and **Interview Call letter** from IISc Admissions. You may download the call letter from the IISc Admissions Portal. This call letter will specify a *date and session (morning/afternoon)* when the in-person interview will be held for the Research Programs (PhD/MTech Research) at the Department of Computational and Data Sciences (CDS).

This interview process comprises of two consecutive phases for shortlisted candidates: **Phase I** will be an **aptitude test**, which serves as the first part of the evaluation and **Phase II** will be an **oral interview** for all candidates who qualified in Phase I. Both these phases will be *held in-person (on the same day and session)* in the CDS department. All shortlisted candidates will take the Phase I aptitude test. However, Phase II oral interview is *only for students who attempt and qualify* in Phase I. The oral interviews for the qualified candidates will be held immediately after the results for Phase I are announced. The syllabus for the aptitude test and interview (lab-specific readings) are given below.

About one or two weeks before the in-person interview date, the shortlisted candidates will be sent an email from the CDS department to fill out an **Online Student Information Form**. This must be completed and submitted in order to participate in the interview. Importantly, candidates should **choose between one to three labs** in the department for which they will be considered and also whether you wish to be considered for the **Ph.D. program, MTech(Research) program or both**. The CDS research labs and their research area are described below. *The Phase II interview topics will be relevant to the labs that you have chosen, as listed below.* If successfully admitted, students will be placed in one of these labs for conducting their research.

Orientation sessions and lab introductions to help candidates make the right choice based on their interest will be conducted online through webinars, 1-2 week before the interview. Shortlisted candidates will be emailed details of the same, and dates will be displayed on the CDS Research Admissions Website too.

Phase I Aptitude Test

The Phase I aptitude test will be held in the CDS department. This will be a *computer-based in person test* at the CDS labs in the slot as mentioned in your interview call letter. You must report at the department by **8AM** for the morning session and by **1PM** for the afternoon session. Completing the *Online Student Information Form* is mandatory to appear in Phase I.

The syllabus for the aptitude test is as follows.

- **Part A (Mathematics):** Combinatorics, Linear Algebra/Matrices, Probability and Statistics, Differential Equations, Interpretting Plots
- **Part B (Programming):** Data Structures and Algorithms in *Python, C, C++ or Java*

The aptitude test will be held on a digital computer using the HackerEarth online platform. You will be provided a computer to attempt the test and need not bring your personal computers. You will have **around 45mins** to complete the test.

There will be *5 questions* in Part A: Mathematics, and 4 questions in Part B: Programming. For Part B, you will be writing code in Python, C, C++ or Java to implement your logic, compile and submit to pass test cases. A basic code template will be given but no code assistance, auto-complete, etc. will be available. You may also be asked to debug a code block or critique a solution devised by an LLM agent-based coding system.

Students should first *solve the problems that they are comfortable with* and then move on to more difficult problems. Specifically, in Part B, we expect students only to have sufficient time to attempt 2 questions. Thus, choose your question wisely.

In-Person Oral Interview

Students who qualify in the Phase I computer-based aptitude test will be announced within 30mins of the test concluding. Only those who quality should attend the subsequent Phase II oral interview in the same session. We expect the Phase II interviews to **conclude by 2PM** (for those in the morning session) and **by 9PM** (for those in the afternoon session). So plan your travel accordingly.

In the oral interview, you will be questioned on the following basic topics, and also on advanced topics that are based on your lab preferences:

- ***Basic Topics*:** Linear Algebra; Probability & Statistics; Programming, Data Structures, Algorithms; Numerical Methods; Ordinary Differential Equations; Discrete Mathematics. You need to prepare at the Final year ndergraduate engineering level.
- ***Advanced Topics:*** You will be questioned on the topics related to labs you selected in the *Online Student Information Form*. The topics for each lab and the prior training expected are listed below. Candidates choosing a lab must be prepared on *at least one* of the lab-related interview topics.

Note: Most labs give *preference to applicants for the Ph.D. program* over the *M.Tech. (Research) program*. Some labs may not even take any students for the M.Tech. (Research) program. Students with a B.E./B.Tech. degree are eligible to apply directly for the Ph.D. program.

Candidates for the Ph.D. program should prepare well on their fundamentals, come with a focus and knowledge of the research areas they would like to target in their Ph.D., and have clarity on the preferred lab(s) and the kind of work done in them. Carefully review the research topics and papers from the labs you are interested in.

List of Labs Admitting Students in the 2026 Admission Cycle

The following labs (ATCG, BioMedIA, BCL, CSPL, FLAME, MATRIX, MIG, NATL, QUEST) accept students from all background qualifications.

1. Algorithmic Techniques for Computational Genomics (ATCG)

Faculty: Chirag Jain

Website: *https://at-cg.github.io*

Lab Description: The ATCG lab conducts research at the intersection of computer science and biology, with the goal of accelerating discovery in the life sciences through the development of advanced algorithms and open-source software tools. Our work focuses on computational challenges arising from the analysis of large-scale DNA and RNA sequencing datasets. Please refer to the lab website to learn more about ongoing projects and recent publications.

Interview topics: Algorithm design and analysis, data structures, basic graph algorithms.

Students are encouraged to review fundamental data structures (such as arrays, linked lists, stacks, queues, and trees) and core algorithmic techniques (such as sorting, searching, greedy algorithms, divide-and-conquer, and graph algorithms). During the interview, students should be able to clearly explain their reasoning and articulate their algorithmic approaches. Several resources are available online to review these topics, including *Introduction to Algorithms* by Cormen et al.

Prior training: Students should have a background in engineering, computer science, or applied mathematics. Strong programming ability and experience in algorithm development are expected.

2. Biomedical Image Analysis (BioMedIA) Lab

Faculty*:* Vaanathi Sundaresan

Website: https://sites.google.com/view/biomedia-lab/home

Lab Description: Our aim is to develop innovative AI-based methods for computational analysis of multidisciplinary biomedical images for clinical applications. We specifically focus on building scalable and translatable machine learning tools for big data applications. We are also interested in tackling key challenges of medical image analysis including label scarcity and data diversity, long-tail distribution, model generalisability and interpretability, fairness in AI and Bias mitigation.

Our current research areas include computer vision and machine learning-based methods for identification of MR imaging biomarkers for various diseases and their population-level impact, multimodal federated learning, semi-supervised techniques for analysis of various imaging modalities, data harmonisation/domain adaptation, point-of-care imaging solutions, methods for personalized medicine, image reconstruction and quality improvement.

Interview topics: Signal Processing, Image Processing, Linear Algebra, Probability and Machine Learning basics.Prior Training: We are looking for students with an engineering background, preferably Computer Science or Electrical, Electronics and/or Communications, with strong programming skills and interdisciplinary training, interested in the following topics: deep learning and computer vision applications, image processing and medical imaging.

3. Biomolecular Computation Laboratory (BCL)

Faculty*:* Debnath Pal

Website: *https://cds.iisc.ac.in/faculty/dpal/*

Lab description: The aim of the lab is to understand biological data for insights into biological structure, function and processes at multiple scales. The scope of work spans the areas of genomics, proteomics, metabolomics, structural biology, health and disease (including digital health), methods and algorithms. There is an opportunity to do research problems in real-life projects in cancer, diabetes, neurodegeneration etc., where intensive bio-computational analysis is required.

For the Aug 2026 admissions, we are looking for two PhD students to work in the broad areas of health and disease which may involve translational components.

Interview topics: Students are expected to have good programming knowledge and a sound understanding in at least one of the basic subjects at the undergraduate level: Math, Physics or Chemistry. Exposure to data science, bioinformatics and computational biology is desirable but not essential.Prior training: Students with sound knowledge in any background and enthusiasm for learning biology.

4. Computation, Statistics & Physics Lab (CSPL)

Faculty: Murugesan Venkatapathi

Lab description: *https://cds.iisc.ac.in/faculty/murugesh/lab_html/*

Lab description: Current interests at CSPL can be broadly grouped into (a) Theoretical and computational models in condensed matter physics, (b) Randomized algorithms and statistical computing, and (c) Numerical methods and Scientific computing.

CSPL is looking for a PhD student to work in (a). We are also tentatively open to exceptional research students in areas (b) and (c).

Lab description: Linear/Matrix algebra, numerical methods, statistics, and topics in physics as appropriate for the research area.Prior training: A degree in Engineering or Physics or Mathematics.

5. FLAME:Lab (FLow Analysis and Multi-physics simulations at Extreme-scale) Lab

Faculty: Konduri Aditya

Lab description: https://cds.iisc.ac.in/faculty/konduriadi/ and https://flamelab-iisc.github.io

Lab description: The research group focuses on the simulation and analysis of multi-scale multi-physics fluid flow problems that leverage high performance computing (HPC) platforms and machine learning (ML). Specifically, the work would involve development of HPC centric numerical methods and algorithms for solving partial differential equations (PDE) that are relevant to computational fluid dynamics (CFD), application of machine learning methods to analyze and model data generated from simulations, and investigation of turbulent flow problems that arise in combustion systems (gas turbine and scramjet engines), high-speed aerodynamics and environmental flows.

Our current projects include machine learning based reduced-order modelling (ROM) for reacting flows, scalable asynchronous PDE solvers, low-precision computing, hydrogen combustion, and detection & forecasting of extreme events. Please visit our lab website for more details. For the Aug 2026 admissions, we are looking for three PhD/MTech (Research) students.

Interview topics: Numerical methods, linear algebra, probability, scientific programming, differential equations, fluid mechanics (optional), programming models (optional)Prior training: Students should have a Bachelors' or Masters' degree in any one of the following areas: Mechanical Engineering, Aerospace Engineering, Chemical Engineering, Computational Engineering, Computational Physics, Applied Mathematics, Scientific computing or similar areas. Ph.D. candidates are preferred.

6. MATRIX:Lab (Materials-physics & Algorithmic Techniques Research In eXtreme-computing)

Faculty: Phani Motamarri

Website: *https://cds.iisc.ac.in/faculty/phanim/*

Lab description: At MATRIX Lab, our research thrives at the crossroads of quantum mechanics, continuum physics, material modelling, numerical linear algebra, HPC and AI for science. In particular, the focus is on developing scalable algorithms, advanced computational methods, machine learning frameworks, and exascale-ready codes to accelerate quantum simulations of materials and drive next-generation scientific discovery by addressing novel applications involving complex materials systems. As a part of their work, students will also contribute to massively parallel open-source code DFT-FE, the workhorse behind the 2023 ACM Gordon Bell Prize — the prestigious prize in high-performance computing. The research you conduct will truly reflect our country's indigenous ability to build methods and open-source exascale codes, ensuring our nation remains competitive in this exascale era. Our lab is also developing quantum-computing-based algorithms to accelerate scientific computations targeting large-scale eigenproblems and partial differential equations arising in various areas of science and engineering.

If you're someone who is passionate about coding, mathematics, and physics-driven computation, you'll find yourself at home here. This is an exciting opportunity for students from engineering (non-CS) and science backgrounds to engage in multidisciplinary research at the forefront of computational and data sciences. In Aug 2026 admissions, the MATRIX lab is seeking bright, highly motivated research students to join our lab. We are looking for candidates interested in conducting highly interdisciplinary research spanning the disciplines outlined above.

Interview topics: Numerical methods, Linear Algebra, Calculus, Scientific programming, Differential equations, Topics based on student's UG/PG background. (for eg: Solid Mechanics, Quantum Physics, Computational Materials, Finite-element methods etc.,)Prior training: Bachelor's or a Master's degree in any one of the following areas: Engineering Physics/Physics, Mechanical Engineering, Materials Engineering, Chemical Engineering, Computational Engineering, Physics, Applied Mathematics or similar areas. Strong programming skills are a must.

7. Medical Imaging Group (MIG)

Faculty: Phaneendra Yalavarthy

Website: https://cds.iisc.ac.in/faculty/yalavarthy/MIG/

Lab description: The research group works on AI-powered medical imaging. We develop novel deep learning models for medical image reconstruction and analysis, with a focus on fast, clinically deployable solutions that bridge lab and clinic (bench and bed). Ideal for ambitious PhD students passionate about translational AI in healthcare, gain hands-on experience tackling real-world challenges in fast-evolving fields like rapid MRI and diagnostic tools.

Accepting Ph.D and M.Tech (Res)

Interview topics: Linear Algebra (and/or) signal processing.Prior training: Basic Qualifications: B.E./B.Tech. in EE/ECE/IN/CS/IT/BME (or) M.Sc. (Mathematics/Physics) with a strong programming background.

8. NATL Lab

Faculty: Ratikanta Behera

Website: https://cds.iisc.ac.in/faculty/ratikanta/

Lab description: The Numerical Algorithms and Tensor Learning Laboratory focuses on Scientific and Intelligent Computing, advancing mathematically rigorous and computationally efficient machine learning techniques to address challenging problems arising in data science, engineering, and scientific discovery. Core research areas include tensor computations, physics-informed neural networks (PINNs), neural network architectures for time-varying systems, deep learning for scientific computing, neural operator learning, numerical linear algebra, numerical solution of partial differential equations, wavelet-based machine learning techniques, quantum machine learning for scientific computing, and high-dimensional data analysis. By integrating principled mathematical foundations with modern machine learning techniques and quantum computing paradigms, the lab seeks to develop intelligent algorithmic solutions that are both theoretically sound and practically impactful. The lab welcomes motivated researchers with strong backgrounds in mathematics, machine learning, or engineering who are passionate about interdisciplinary research at the frontier of scientific and intelligent computing.

Interview topics: Candidates will be assessed on core topics including linear algebra and matrix theory, numerical methods and analysis, and ordinary and partial differential equations. Knowledge of scientific computing tools such as MATLAB or Python programming for the above topics is expected.

Prior training: A strong foundation in mathematics, particularly linear algebra, numerical analysis, and applied mathematics, is expected. Proficiency in programming languages such as MATLAB, and/or Python is preferred. Candidates with a background in mathematics, statistics, computer science, electrical engineering, or related disciplines are encouraged to apply. Prior exposure to machine learning, scientific computing, computational methods, or physics-informed modeling is advantageous. A genuine interest in interdisciplinary research at the interface of numerical algorithms, tensor methods, and data science, along with strong analytical and problem-solving skills, is highly desirable.

9. QUEST Lab

Faculty: Deepak N. Subramani

Website: https://cds.iisc.ac.in/faculty/deepakns/

Lab description: QUEST Lab conducts interdisciplinary research in Scientific Machine Learning and AI for Science and Engineering, balancing method development and practical applications. Currently, our interest is in multi-modal AI, foundation models for scientific data, physical intelligence and neural data assimilation.

Interview topics: Applied Probability, Numerical Linear Algebra, General Aptitude (we will specifically test for your ability to operate with limited information, probing you on how you overcome adversity), Basics of Deep Learning, Algorithmic Thinking (How you would instruct a digital computer to perform regular tasks).

Prior training: Any bachelor's degree is welcome. Academically well-versed and highly competitive candidates with an interest in our research and the ability to focus for long hours are welcome, irrespective of their background. Strong programming skills beyond simple prompting in free Chatbot versions are a must. We especially welcome students with interdisciplinary interests, for example, a Bachelor's degree in Mechanical/Aerospace/Civil/ECE/EE with self-taught programming (Deep Learning) skills.

The following labs (DREAM, MARS, NLP, VAL, VCL) only accept students from CS/ECE/EE (i.e., circuits) background qualification.

1. DREAM:Lab (Distributed systems Research on Emerging Applications & Machines)

Faculty: Yogesh Simmhan

Website: https://cds.iisc.ac.in/faculty/simmhan

Lab Description: At the DREAM:Lab, we advance the state-of-the-art in distributed systems, scalable ML platforms and large-scale graph analytics, with a strong record of impactful research published at top-tier systems conferences and journals, accompanied by open-source software for real-world adoption and industry placements. We build next-generation software infrastructures spanning cloud, edge, and emerging quantum environments, combining distributed algorithms, scalable data architectures and rigorous systems-engineering to tackle high-impact applications in fintech, autonomous systems and smart city/IoT platforms. Our work emphasizes hands-on experimentation on operational cloud, edge, GPU and HPC systems, supported by active collaborations with IBM Research, NPCI/UPI, UMass Amherst, USC and University of Melbourne.

For the 2026 Admissions cycle, the DREAM:Lab is looking for 3-4 enthusiastic students in these topics:

- Agentic AI Platforms for Optimizing Cyber-Physical Systems (e.g., drone fleets, IoT)
- Orchestration of Agentic AI on Serverless Cloud Platforms (with IBM Research)
- Federated learning and LLM fine-tuning on edge accelerators
- Orchestration of Quantum-Classical Workflows on Quantum/Cloud/HPC (part of NQM)
- Distributed billion-scale graph mining in fintech and mobility domains
- Scalable private blockchain and consensus for fintech transactions (with NPCI)

Interview topics: Operating Systems (or) Graph Algorithms (or) Distributed Systems.

Recommended Reading:

1. Operating System Concepts by Silberschatz, Galvin and Gagne
2. Distributed Systems: Concepts and Design by Coulouris, et al.
3. Optimizing FaaS Platforms for MCP-enabled Agentic Workflows, https://bit.ly/admit-dl-1
4. Pregel: A System for Large-Scale Graph Processing, *SIGMOD*, 2010, https://bit.ly/admit-dl-2

Prior training: Students must have a Bachelors/Masters degree in Computer Science, Electrical, Electronics, Communications or related disciplines. Students must have strong aptitude and demonstrated skills in systems software, algorithms and programming. Ph.D. candidates are preferred.

2. Middleware And Runtime Systems (MARS) Lab

Faculty: Sathish Vadhiyar

Website: *https://cds.iisc.ac.in/faculty/vss*

Lab Description: High performance computing (HPC), Parallel computing – middleware, system software, algorithms and applications on large-scale parallel computers and GPUs.

Some of the recent research topics in the MARS lab are the following.

· Harnessing the power of both CPUs and GPUs in a hybrid manner for AI/ML applications.

· Novel models of parallelism for Machine Learning (ML)/Deep Learning (DL) applications.

· Fault tolerance frameworks for parallel scientific and ML/DL applications.

Interview topics:

1. Operating Systems including pthreads, filesystems.

2. Computer architecture including multi-core CPUs and modern GPUs, differences between shared memory and distributed memory parallel architectures, different network topologies (e.g., ring, mesh etc.)

3. MPI parallel programming interface – Google for "MPI Complete reference" and read Introduction, Point-to-Point and Collective Communications chapters.Prior training: Students must have a Bachelors' or Masters' degree in Computer Science, Information Technology, Electrical, Electronics and/or Communications. Strong programming, algorithms and systems skills are required. Ph.D. candidates are preferred.

3. Natural Language Processing (NLP) Lab

Faculty: Danish Pruthi

Website: *https://danishpruthi.com/*

Lab Description: This lab broadly works in the areas of Natural Language Processing (NLP) and Artificial Intelligence (AI). It is almost certain that machine intelligence, and particularly, language technologies will have a large socioeconomic impact. These technologies already touch our lives: from answering questions we ask, curating content we read, (auto)-completing words we are likely to type, translating text from languages we don't understand, to flagging content we might find harmful. Broadly, we are interested in:

- Detecting AI-generated content, and broadly, curbing unhealthy reliance on AI,
- Measuring and improving geo-cultural representation in AI,
- Evaluating large language models (LLMs), with an emphasis to enable responsible use.

From the outset, the lab is envisioned to be diverse, transparent, friendly and highly collaborative.

Interview topics: Language Modeling, Probability and basics of Machine Learning and Deep Learning.Prior training: Students must have a Bachelors' or Masters' degree in Computer Science, Information Technology, Electrical, Electronics and/or Communications or other closely related disciplines.

4. Vision and AI Lab (VAL)

Faculty: R. Venkatesh Babu

Website: *http://val.cds.iisc.ac.in*

Lab Description: At VAL, we aim to perform world-class research in the broad fields of Computer Vision and Machine Learning, to push the performance limits on different applications, and ensure their reliability in practical settings. Our research and expertise spans across several areas in Deep Learning for Computer Vision as listed below:

i) Representation Learning ii) Domain Adaptation and Generalization iii) Adversarial Attacks and Defenses iv) Self-supervised and unsupervised learning v) 3D Vision/Gaussian Splatting vi) Learning on long-tail data vii) Generative models viii) Multi-modal learning ix) Fairness and Bias.

Interview topics: Linear Algebra, Probability, Machine Learning and Image Processing/Computer Vision (optional)Prior training: Students must have a Bachelor's or Master's degree in either Computer Science, Information Technology, Electrical, Electronics and/or Communications or in any other closely related areas.

5. Visual Computing Lab (VCL)

Faculty: Anirban Chakraborty

Website: *http://visual-computing.in/*

Lab Description: At VCL, we are interested in developing novel computer vision and machine learning algorithms to solve visual analytics problems arising from real-world applications. The majority of our ongoing research projects can be categorized into one of the following three areas – 1. Data-efficient & privacy-preserving deep learning (zero-shot/few-shot knowledge distillation, continual learning, source-free/unsupervised domain adaptation, data-free adversarial defense, federated learning etc.), 2. Learning across modalities/domains (e.g., text-driven 3D scene editing, text-based image retrieval, sketch-guided localization, visual question answering, domain adaptation etc.) and 3. Perceiving humans and their actions (e.g., person-reidentification, anomaly detection, human gait and pose analysis etc.).

Interview topics: Probability and Machine Learning basics. Students are also strongly encouraged to read at least one recent paper from our group (see *https://visual-computing.in/publications/*) that aligns well with their research interests.Prior training: Students must have a Bachelor's or Master's degree in Computer Science, Information Technology, Electrical, Electronics and/or Communications or in any other closely related areas.

Preference Sheet – Research Admissions Aug 2026 Cycle

Eligibility for labs taking only CS/EE/ECE graduates (please see below for these labs): *B.E./B.Tech., Masters' or equivalent degree in Computer Science/Engineering; Information Technology/Science; Computer Application, Electrical, Electronics, Instrumentation, Communication Engineering, or equivalent disciplines; Good programming skills are required for all labs.*

- You need to fill this Preference Sheet through an **Online Student Information Google Form link** you will receive by email from the CDS department.
- Carefully review the Admissions Brochure, the Research Lab descriptions and their websites before filling the Online Form.
- You may choose between one to three labs for which you are eligible and rank order them.
- The labs chosen in the Form are binding and cannot be changed later. Your interview questions will be based on the labs you choose.
- Choose the lab(s) whose research areas most closely match your own interests.
- Bring a printout of your this page when you come for the interview.

1. Name: _____
2. Application No: _____
3. Program Applied for *(Select all that apply)*: [ ] Ph.D. [ ] M. Tech. (Research)
   Note: Students with a B.E./B.Tech. degree are also eligible to select the Ph.D. program.

Rank up to three research labs you are eligible for, using numbers **1, 2 and 3.**

All backgrounds are welcome	**Labs taking only CS/ECE/EE (i.e., circuits) graduates**
[ ] ATCG Lab [ ] BioMedIA Lab [ ] BCL [ ] CSPL [ ] FLAME:Lab [ ] MATRIX [ ] MIG [ ] NATL [ ] QUEST	[ ] DREAM:Lab [ ] MARS Lab [ ] NLP Lab [ ] Vision and AI Lab (VAL) [ ] Visual Computing Lab (VCL)

I have read and understood the brochure and the instructions before filling in this preference sheet.

Signature: _____ Date: _____ Place: _____