



Welcome to Research Interviews 2024

Dear Applicant,

We are pleased to invite you to attend an interview for a research student position in our department. The interviews will be held **in-person** during the week of **13th to 17th May 2024**, at the CSA department, IISc, Bangalore. Each day will have two sessions, beginning at sharp 9am and 2pm, respectively. The exact date and session of your interview will be communicated to you separately by the Admissions Office of IISc.

The attached note gives you more information about the interview process and will help you to prepare for the interview. Once you have gone through this note, please remember to fill in the online **Option Form** available at <https://forms.gle/5yy8ygNrM6B3knky7> by 11:59pm on Friday 10 May 2024. Among other things in this form you will be asked to choose a research stream, research sub-areas, and back-ground subjects. Please enter your choice carefully as it will determine which panel you will be interviewed by and the topics on which you will be asked questions. Please also note that in case you are admitted to the research programme, you will be expected to work on a research topic within the chosen research stream.

To help you make informed choices during your interview process we encourage you to learn more about our activities by visiting the faculty and lab pages at the CSA website: <https://www.csa.iisc.ac.in>. Additional information is available at <https://www.csa.iisc.ac.in/~deepakd/csa-web/prospective-students/prospective-students.html>

You are welcome to email us at office.csa@iisc.ac.in if you have further questions.

With best wishes,

Vinod Ganapathy
Professor and Chair
Dept. of Computer Science and Automation
Indian Institute of Science, Bangalore.

Research Interview Process at CSA

The interview will test your aptitude and suitability for research in your chosen research sub-areas, as well as your proficiency in the related background subjects. The emphasis will be on testing your understanding of fundamental concepts and problem solving. The interview will typically take around 30 minutes, though it may sometimes extend up to an hour.

In the online Option Form you will be asked to indicate your choice of a *Research Stream*, up to two *Research Sub-Areas* within that stream, and two *Background Subjects* corresponding to that research stream. Please see Table 1 below for details on the available choices.

A list of representative books for these background subjects is available at

<https://www.csa.iisc.ac.in/academics-all/courses/books-for-basic-subjects>

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You will first be examined in your chosen background subjects. This may be followed by more questions related to your choice of research sub-areas.

If you are an **External Registration Programme (ERP)** applicant, the interview will additionally include a *5 minute presentation* on your proposed research area and problem. You would have already discussed the problem with your designated faculty advisor. In the interest of time, please keep your presentation short. Kindly note that projection facilities will not be available. You may bring along with you a one-page writeup to be circulated to the committee members.

Please note that if you are admitted to the research programme, you will be expected to work on a research topic within the research stream you have chosen in the form.

Table 1: Research areas where positions are available, and corresponding background subjects

Research Stream	Sub-Areas where positions are open	Background Subjects
Theoretical Computer Science https://www.csa.iisc.ac.in/theoretical-computer-science	Algorithmic Game Theory, Algorithms, Combinatorial Optimization, Combinatorial Geometry, Complexity Theory, Computational Geometry, Cryptography, Geometric Algorithms and Data Structures, Graph Theory, Secure Distributed Computing.	Data Structures and Algorithms, Discrete Math, Linear Algebra, Probability Theory, Theory of Computation
Computer Systems and Software https://www.csa.iisc.ac.in/computer-systems	Compilers, Computer Architecture, Computer Systems Security, Formal Verification, GPUs, Hardware-Software Co-Design, High-Performance Computing, Operating Systems, Programming Languages, Software Engineering, Software Systems and Accelerators for AI/ML.	Programming is mandatory. In addition, two subjects from Computer Organization, Data Structures and Algorithms, Engineering Math (including Automata Theory, Discrete Math, Linear Algebra, and Probability), Operating Systems.
Intelligent Systems https://www.csa.iisc.ac.in/intelligent-systems	Hybrid Robotic Systems, Machine Learning and Deep Learning, Random Topology, Reinforcement Learning, Robot Learning and Control, Safety-Critical Control, Stochastic Approximation, Topological Data Analysis.	Linear Algebra, Probability Theory