



Welcome to CSA Research Interviews - 2012

Dear prospective ERP research student,

It is our pleasure to invite you for an interview for a possible research student position in our department. Please fill up the attached *Option Form* and bring a hard-copy with you when you appear for the interview here. To learn more about our activities, please visit us at <http://www.csa.iisc.ernet.in>. Prepare well for the interview, on the lines suggested in the note that follows. Please email the admissions committee (admissions@csa.iisc.ernet.in) if you have further questions.

Very best wishes,
Sincerely,

Y. Narahari
Chairman
Computer Science and Automation
Indian Institute of Science
Bangalore - 560 012

A Note on the CSA Research Interviews

- The interview is intended to be a test of the candidate's aptitude and suitability for research in the areas chosen by the candidate and his/her thoroughness of background in related basic subjects. The emphasis will be on testing the depth of candidate's understanding of fundamental concepts.
- The interview will be in two parts: a written test of 30 minutes duration on the day of the interview just before the interview session begins (9 AM and 2 PM on each day), followed by an oral interview. The written test will have 10 questions on the fundamentals of programming, data structures, algorithms, discrete mathematics, arithmetic, geometry, calculus, logic, probability, and linear algebra. You are expected to attempt all 10 questions.
- The oral interview will commence with a 5 minute presentation by you on the proposed research area and problem (which you would have already discussed with your designated faculty advisor here). In the interest of time, please keep your presentation short and kindly note that projection facilities will not be available. You could bring along with you a one page writeup that you could give to all the committee members. Following this, you will be examined in the basic subjects related to the research areas chosen by you (see Table 1). This will be possibly followed by questions in the specific areas of research chosen by you.



| | Research Areas | Basic Subjects |
|--|--|--|
| 1. 2. 3. 4. 5. 6. 7. 8. | Data mining Machine learning Pattern recognition, information retrieval Information theory and learning algorithms Reinforcement learning and stochastic control Vehicular traffic networks, communication networks Game theory and Mechanism Design NLP, Cognitive science | <i>Any two subjects out of:</i> Discrete mathematics, probability theory, linear algebra, optimization |
| 9. 10. 11. 12. 13. | Complexity theory Graph theory Combinatorial geometry, computational geometry Cryptography Algorithmic algebra | Discrete mathematics, data structures, algorithms |
| 14. 15. | Database systems Scientific visualization | Discrete mathematics, data structures, algorithms |
| 16. | Software design, analysis, verification | Discrete mathematics, automata theory, data structures |
| 17. | Compilers | Automata theory, data structures, algorithms |
| 18. 19. | Computer architecture Parallel and high performance computing | Computer organization, data structures, algorithms |
| 20. 21. 22. 23. 24. | Operating systems Systems security Storage systems Distributed systems Adhoc and sensor networks | <i>Any one subject out of:</i> Discrete mathematics, linear algebra, probability theory <i>Required:</i> Data structures, algorithms, operating systems |

Table 1: List of current research areas where positions are available. List of representative books for the basic subjects is available at <http://www.csa.iisc.ernet.in/academics/academics-prospectivestudents-books.php>



Please fill up this form and bring this with you at the time of the interview.

1. Name of the Candidate:
2. Application No. :
3. Date of Interview:
4. Current Affiliation:
5. Highest Qualification and Year of Graduation:
6. Discipline of Highest Qualification:
7. Marks/Grade Secured in the Highest Qualification:
8. GATE Score (if applicable) with Discipline:
9. College and Place Where Studied:
10. Academic Achievements:

11. **Signature:**