

**Department of Computer Science and Engineering**

**Indian Institute of Technology Madras**

**May, 2023**

**Procedure for Direct PhD interviews**

The aim of the interview process for Direct PhD candidates is to assess the knowledge and problem solving ability of the candidate in subjects that are fundamental to Computer Science and Engineering, and to assess the independent thinking ability and research aptitude of the candidate.

During the interview, the candidate will be required to answer questions related to topics in **two subjects** chosen by the candidate from the list of the subjects specific to the panel; see the Panel specific subjects in the following page. For Panel B and Panel C, the candidate may additionally need to answer some questions related to C Programming. In addition to the primary subjects chosen by the candidate, the candidate may also be required to answer some basic questions in other subjects. The duration of the interview is about 40 minutes. You may find [this resource](#) on how to prepare for MS-PhD interviews from one of our faculty useful.

## List of Subjects:

### **Panel A: Theoretical Computer Science and Related Areas**

- ❖ Discrete Mathematics (Logic, Proofs, Counting and Combinatorics, Sets, Relations, and Functions)
- ❖ Graph Theory
- ❖ Theory of Computation
- ❖ Data Structures and Algorithms
- ❖ Basics of Probability Theory
- ❖ Topics in Algorithms (any one or more of Graph-theoretic/Approximation/Distributed/Randomized/Parameterized)
- ❖ Basic Complexity Theory
- ❖ Basics of Cryptography

### **Panel B: Computer Systems and Related Areas**

- ❖ Digital Logic Design
- ❖ Computer Organization and Architecture
- ❖ Compilers
- ❖ Operating Systems
- ❖ Computer Networks
- ❖ Database Management Systems

### **Panel C : AI, ML and Related Areas**

- ❖ Discrete Mathematics
- ❖ Data Structures
- ❖ Design and Analysis of Algorithms
- ❖ Linear Algebra
- ❖ Probability Theory