

Department of Computer Science and Engineering

Indian Institute of Technology Madras

May, 2023

Procedure for PhD interviews for

Panel A: Theoretical Computer Science and Related Areas

The aim of the interview process is to assess the knowledge and problem solving ability of the candidate in subjects that are fundamental to the research areas of the panel chosen by the candidate. The interview will be conducted in two rounds as per the details given below.

Round 1: Candidates will be assessed on basic questions related to subjects that they chose to be interviewed on. The duration of the interview would be around 20 minutes.

Round 2: Candidates who score above a threshold in Round 1 will be invited for the second round of interviews, which will again be based on the subjects that they choose to be interviewed on.

List of Subjects for Panel A:

- ❖ **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**

Department of Computer Science and Engineering**Indian Institute of Technology Madras****May, 2023****Procedure for PhD interviews for****Panel B: Computer Systems and Related Areas**

The aim of the interview process is to assess the knowledge and problem solving ability of the candidate in subjects that are fundamental to the research areas of the panel chosen by the candidate. The interview will be conducted in two rounds as per the details given below.

Round 1: Candidates will be assessed on questions related to **programming in C language**. The duration of the interview would be around 20 minutes.

Round 2: Candidates who score above a threshold in Round 1 will be invited for the second round of interviews. In this round, the candidate is required to select **one subject from each of the two lists**, List B1 and List B2, given below. The questions for the candidate during the interview will be related to these two subjects.

List B1:

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

List B2:

- **Advanced Operating Systems**
- **Advanced Computer Architecture**
- **Advanced Database Systems**
- **Distributed Systems**
- **Wireless Networks**
- **Parallel Processing**
- **Formal Methods**
- **Secure Systems**
- **Cloud Computing**
- **Theory of Programming Languages.**
- **Program Testing/Verification**
- **Program Analysis and Compiler Optimizations**
- **Any other Systems related courses**

Department of Computer Science and Engineering**Indian Institute of Technology Madras****May, 2023****Procedure for PhD interviews for****Panel C (AI, ML and Related Areas)**

The aim of the interview process is to assess the knowledge and problem solving ability of the candidate in subjects that are fundamental to the research areas of the panel chosen by the candidate. The interview will be conducted in two rounds as per the details given below.

Round 1: Candidates will be assessed on their programming and mathematical maturity (basic maths/calculus/quantitative reasoning). The duration of the interview would be around 20 minutes.

Round 2: Candidates who score above a threshold in Round 1 will be invited for the second round of interviews. In this round, the candidate is required to select one subject from each of the two lists, List C1 and List C2, given below. The questions for the candidate during the interview will be related to these two subjects.

List C1:

- Programming and Data Structures
- Probability and Statistics
- Discrete Mathematics
- Linear Algebra

List C2:

- Artificial Intelligence
- Machine Learning
- Natural Language Processing
- Computer Vision
- Speech Technology
- Computational Biology
- Computer Graphics