



**Department of
Computer Science and Engineering
Indian Institute of Technology Madras**

**Presentation to MS,
Direct PhD and PhD Candidates
23rd May, 2021**

**Prof. C. Chandra Sekhar
Head of Department**



Department Profile

- **Faculty Members: 35**
 - All have completed **Ph.D. Degree from Premier Institutions** in India or abroad
- **Technical and Administrative Staff Members: 10**
- **Ph.D. Students: 90**
- **M.S. Students: 78**
- **M.Tech. Students: About 135**
- **B.Tech. and Dual Degree Students: About 330**



Application Statistics

Program	No. of Seats for Academic Year 2020-2021	No. of Applications Received
PhD/ Direct PhD	20 HTRA Project, External, Part time	504 – Regular PhD 92 – Regular Direct PhD 27 – External PhD 70 – Part-Time PhD
MS	17 HTRA Project, External, Part time	885 – Regular MS 7 – External MS 16 – Part-Time MS



Research Programmes

- **MS (by Research)**

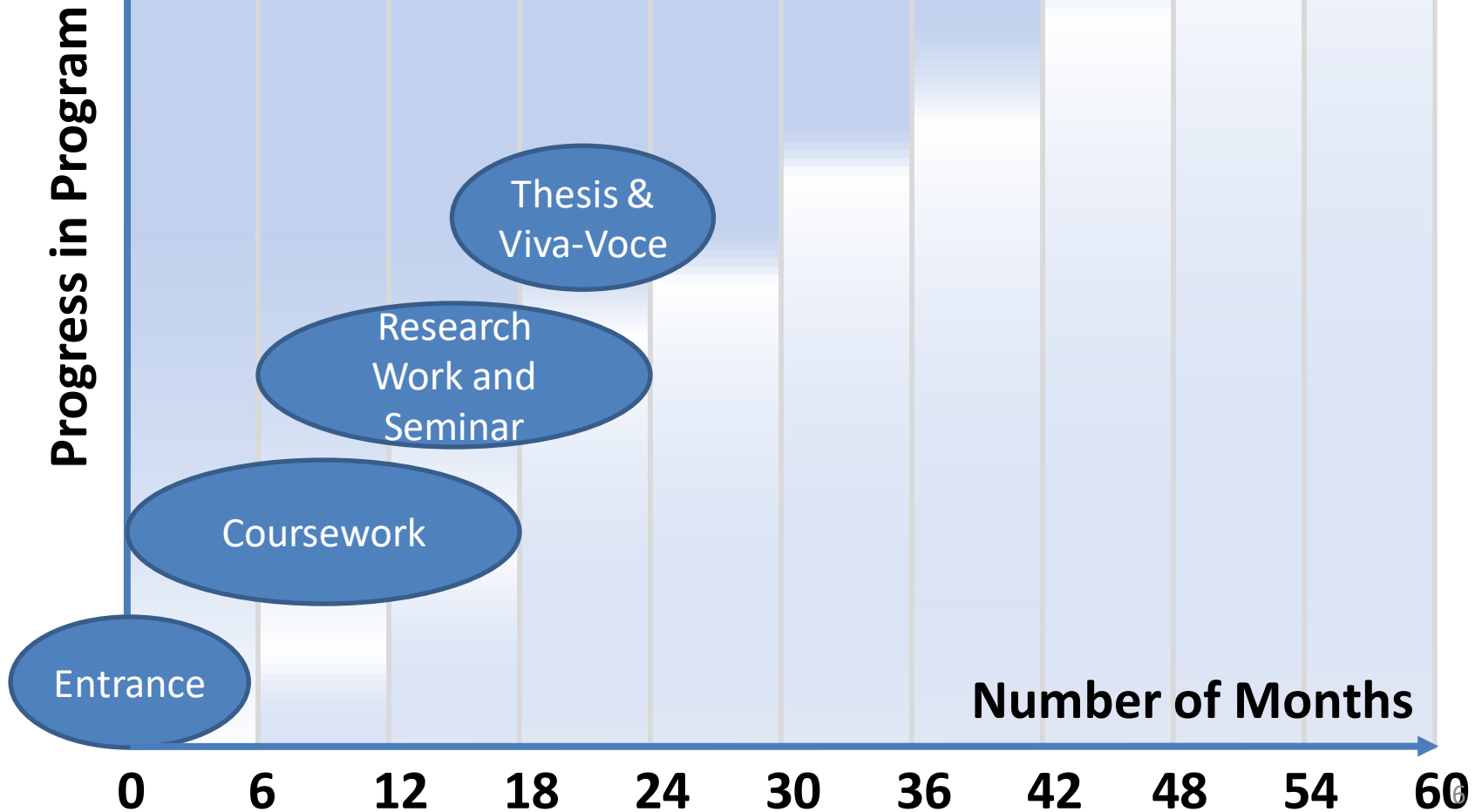
- Full-time MS (HTRA and Project)
- External MS (for industries certified by IITM/DSIR)
- Part-time MS (for industry) – within commuting distance of IIT Madras

- **PhD**

- Direct PhD (after B. Tech) will get both MS and PhD
- Regular PhD (Master's degree required)
 - Full-time PhD (HTRA and Project)
 - External PhD (for industries certified by IITM/DSIR)
 - Part-Time PhD (for industry) – commuting distance of IITM
 - AICTE/QIP PhD
- Upgraded PhD (from MS and M Tech programs at IITM)



MS Process





MS Requirements

- **Minimum of 5 courses**
- **M.S. Thesis:**
 - Proposal and Seminar (around 1.5-2 years)
 - Synopsis and Thesis
- **Publications (Conference and Journal) from thesis**
- **Thesis is reviewed by 2 experts outside or within IIT Madras**



MS Scholarship Support

- **HTRA Scholarship**
 - Provided by Government of India
 - Initially **up to 2 years**, based on regular performance review and recommendation by GTC. An **additional 6 months of support** may be granted by IITM
 - **One international conference travel during MS study**
 - **Two national conferences per year**
- **Project**
 - Supported on a CSE Faculty Member's Funded Research Project – Government or Industry funded
 - Several faculty have active research projects: Please visit their webpages or email them.

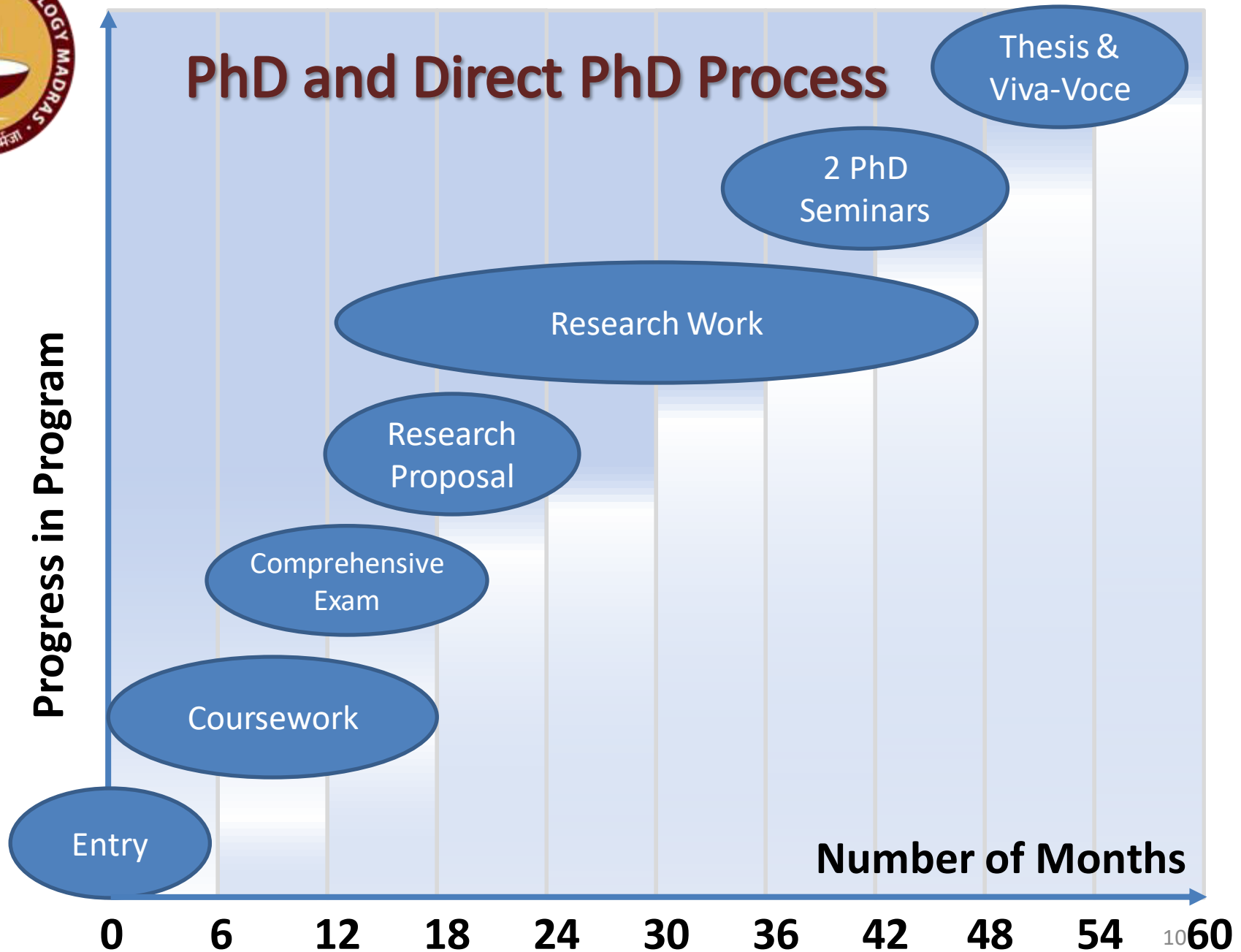


Upgrading to PhD

- **Students in MS degree program can upgrade to Dual MS+PhD degree program, before end of second year**
 - **Dual Degree (MS/PhD) students will receive 2 International conference travel grants**
- **Students in M.Tech. degree program can upgrade to Dual M.Tech+PhD degree program, after first year in M.Tech. program**



PhD and Direct PhD Process





Ph.D. Requirements

- Minimum of **4 courses** for **PhD**
- Minimum of **8 courses** for **Direct PhD**
- **Ph.D. Thesis:**
 - Proposal and Two Seminars
 - Synopsis and Thesis
 - Viva Voce Exam
- **Publications (Conferences and Journals) from Thesis**
- Thesis is reviewed by **2 experts outside IIT Madras**
- IIT Madras has signed **17+ Joint Doctorate programs** with foreign institutions
 - **Australia, Germany, NUS, US, France, Finland**



PhD and Direct PhD Scholarship Support

- **HTRA**
 - Provided by Government of India
 - Maximum of 5 years, based on regular performance review and recommendation by Doctoral Committee
 - One international conference travel during PhD study
 - 2 national conferences per year
- **Project**
 - Supported on a CSE Faculty Member's Funded Research Project
 - Several faculty have active research projects: Please visit their webpages or email them.
- **External Fellowships (after joining program)**
 - TCS, IBM, Google India, Prime Minister's Research Fellowship



Research Areas

- **Hardware Systems** (Computer Architecture, Embedded Systems, Secure Systems)
- **Human-Computer Interaction** (Computer Vision, Image Processing, Speech Processing)
- **Intelligent Systems and Knowledge Engineering** (Artificial Intelligence, Machine Learning, Deep Learning)
- **Networks and Distributed Systems**
- **Programming Languages, Compilers and Software Engineering**
- **Theoretical Computer Science and Algorithms** (including Cryptography)
- **Computational Brain Research (CBR)**
- **Bioinformatics**



Research Labs

- **ACT Lab (Algorithms and Complexity Theory)**
- **AIDB Lab (Artificial Intelligence and Databases)**
- **BIRDS Lab (Bioinformatics and Integrative Data Science)**
- **DAWN Lab (Distributed and Adaptive Wired/Wireless Networks)**
- **SMT Lab (Speech and Music Technologies)**
- **PACE Lab (Programming Languages, Architecture, and Compilers Education)**
- **RISE Lab (Reconfigurable and Intelligent Systems Engineering)**



Research Labs

- **DOS Lab (Software Systems Research)**
- **Speech and Vision Lab**
- **Theoretical Computer Science (TCS) Group**
- **Cryptography, Cybersecurity and Distributed Trust (CCD) Group**
- **HPCN Lab (High Performance Computing and Networking)**
- **Computer Vision Lab**
- **VP Lab (Visualisation and Perception)**

Faculty Ph.D. Degree Institutions





Faculty



Shweta Agrawal
Cryptography,
Information
Theory



John Augustine
Distributed
Algorithms,
Randomized
Algorithms



Sutanu Chakraborti
Machine learning,
Case Based
Reasoning



Sukhendu Das
Visual perception,
Image Intelligence,
Graphics,
Visualization



Kartik Nagar
Automated Formal
Verification,
Program Analysis,
Programming
Languages



Harish Guruprasad
Machine Learning
Learning Theory
Optimization





Faculty

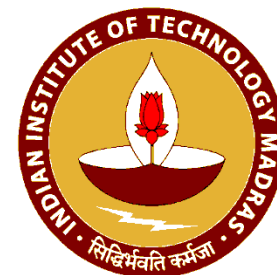
D. Janakiram

Large Scale Distributed Systems, Cloud and Grid Computing, Big Data Systems



V. Kamakoti

Software for VLSI Design, High-Performance Computing



Mitesh Khapra

Statistical Machine Translation, Text Analytics, Deep Learning, Crowd-Sourcing



Deepak Khemani

Artificial Intelligence, Case-based reasoning, Knowledge Representation, Planning, Logic



P. Sreenivasa Kumar

Semi-Structured Data, Semantic Web Technologies, Ontologies



Manikandan Narayanan

Bioinformatics, Computational network biology, Data science.





Faculty

Anurag Mittal

Computer Vision,
Multi-Camera Vision,
Sensor Planning,
Surveillance



C. Siva Ram Murthy

Ad hoc Wireless
Networks,
Real-Time Systems,
Parallel and
Distributed Computing



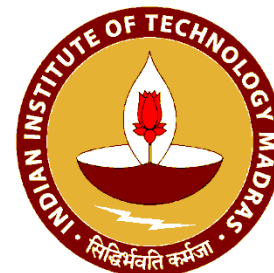
Hema A. Murthy

Speech Technology,
Music Analysis,
Computational Brain
Research



Madhu Mutyam

Computer
Architecture,
Network-on-Chip
Architectures



V. Krishna Nandivada

Compilers, Program
Analysis, Programming
Languages, Multicore
Systems



N.S. Narayanaswamy

Analysis of algorithms
Parameterized
Complexity theory,
Artificial Intelligence





Faculty



Meghana Nasre

**Graph Theory,
Algorithms, Matching
with Preferences**



Rupesh Nasre

**Compilers,
Parallelization,
Program Analysis**



L. A. Prashanth

**Reinforcement
Learning, Stochastic
Optimization, Multi-
armed Bandits**



C. Pandu Rangan

**Cryptography and
Security Protocols,
Graph theory,
Randomized and
Parallel Algorithms**



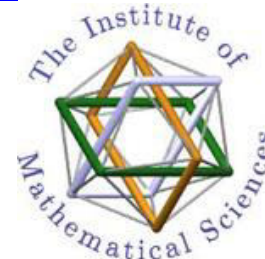
Pratyush Kumar

**Cyber Physical
Systems, Machine
Learning**



B. V. Raghavendra Rao

**Computational
Complexity Theory,
Algebraic Complexity,
Combinatorial
Commutative Algebra**





Faculty

B. Ravindran

Machine learning,
Deep Networks,
Reinforcement Learning,
Social Network Analysis,
Data and Text Mining



Chester Rebeiro

Hardware Security,
Operating System
Security, Side-Channel
Analysis, Cryptography



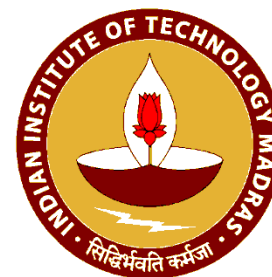
Jayalal Sarma M.N.

Computational
Complexity Theory,
Circuit Complexity,
Algebra and
Computation



C. Chandra Sekhar

Speech Recognition,
Machine Learning,
Deep Learning,
Kernel Methods



Krishna Moorthy Sivalingam

Wireless Networks,
Sensor Networks,
Optical Networks



Arun Rajkumar

Machine Learning,
Rank Aggregation,
Statistical Learning





Faculty



Yadu Vasudev

Sub-linear Algorithms,
Computational
Complexity Theory,



K.C. Sivaramakrishnan

Programming models,
Compilers, Static
Analysis, Schedulers,
Threading Systems, and
Memory Management



**Nishad Bharat
Kothari**

Graph Theory,
Matching Theory,
Combinatorial
Optimization



Ayon Chakraborty

Mobile systems,
Wireless sensing



Akanksha Agrawal

Parameterized
complexity,
Computational
geometry, Graph
algorithms





Adjunct Faculty

Manikantan Srinivasan

Veryx Technologies

Data communication networks, Network virtualization and softwarized cellular mobile communication networks, Wireless LANs, Cybersecurity



Sriraam Natarajan

The University of Texas at Dallas, USA

Artificial Intelligence, Machine learning, Graphical Models, Relational Learning



Ravishankar Krishnaswam

Microsoft Research India, Bangalore

Approximation Algorithms, Online Algorithms



Deepak Padmanabhan

Queen's University Belfast

Data Analytics, Machine learning, Similarity Search, Fairness in Machine Learning



Sarath Chandar

École Polytechnique de Montréal, Canada

Recurrent Neural Networks, Lifelong Learning, Reinforcement Learning, Deep Learning, Natural Language Processing





Distinguished Chairs and Visiting Chair Professors



[Partha Mitra](#)

Cold Spring Harbor Lab,
New York, USA

Prof.H.N. Mahabala
Distinguished Chair In
Computational Brain
Research



[Vyas Sekar](#)

CMU, Pittsburgh, USA

Venky Harinarayan
and **Anand Rajaraman**
Visiting Chair Professor



[Mriganka Sur](#)

MIT, Cambridge, USA

Shri N.R.Narayana Murthy
Distinguished Chair in
Computational Brain
Research



[David Peleg](#)

Weizmann Institute of
Science, Rehovot, Israel

Venky Harinarayan
and **Anand Rajaraman**
Visiting Chair Professor



Modified Procedure for PhD Interviews

This year, a large number of candidates preferred to be interviewed by two panels. Due to time constraints, the procedure for interview is modified as follows:

- For every panel, there will be two rounds of interviews, Round 1 and Round 2.
- All the candidates who gave a panel as their first preference or second preference will be interviewed in Round 1 by that panel.
- Only those candidates whose performance in the Round 1 of a panel is above a threshold will be interviewed in the Round 2 of that panel.
- The final selection is for PhD admission is based on the performance in Round 2.



Modified Procedure for PhD Interviews

For different panels, questions in Round 1 will be from topics listed below.

Panel A: Discrete Mathematics (Combinatorics, basic graph theory, basic algebra and elementary properties of numbers as relevant), Data Structures and Algorithms, and Automata Theory

Panel B: Programming in C language

Panel C: Programming, Mathematical ability and Analytical ability

Dates for PhD Interviews:

Round 1 interviews for Panel A and Panel B: 28th May, 2021

Round 1 interviews for Panel C: 28th and 29th May, 2021

Round 2 interviews for all Panels: 31st May, 2021 and 1st June, 2021



Timeline for Admission

MS interviews: 24-26 May, 2021

Direct PhD interviews: 27th May, 2021

PhD Round 1 interviews: 28-29 May, 2021

PhD Round 2 interviews: 31st May – 1st June, 2021

Announcement of results: 15-25 June, 2021

Tentative date for Admission: 19th July, 2021

Commencement of Classes: 1st August, 2021



Invitation

Department of Computer Science and Engineering
IIT Madras

Invites

YOU

to be part of the
Academic Expedition in the Department
to **LEARN, EXPLORE** and **ACHIEVE**



Wish You all the Best

THANK YOU