ramitd@imsc.res.in ℜAMIT DAS

Basic Details

- **D.O.B** : 15-09-1991
- **Address** : B/19, Jayashree Park, Behala, Kolkata - 700034, W.B. , India.
- **Ph. No.** : 9051106631

Research Interests

- Descriptive Complexity - in particular understanding the limitations of the least fixed point logic, LFP.
- Modal Logic - understanding the reasons why modal logic is so powerful and use it to contrast with an undecidable logic like FO(LFP).
- Game Theory - model social choice phenomena and offer logics wherein the said phenomena can be formalised. From the game logic, if we are able to extract a game algebra then might have more foray into the social phenomena than what might have been known previously.
- Algorithms - design algorithms for the problems arising out of the above investigations by having a closer look at the computational resources like - determinism, randomness, approximation and parameterised complexity.

Conference Publications

1. **Ramit Das**, Anantha Padmanabha, R. Ramanujam. *Reasoning in Large Games with Unboundedly Many Players* Logic, Rationality, and Interaction, 8th International Workshop, LORI 2021, Xi'an, China LORI 2021: 41-57
2. **Ramit Das**, R. Ramanujam. *A logical description of strategizing in social network games* Proceedings of LNGAI 2021, First International Workshop, Hangzhou, China LNGAI 2021 : 107-119
3. **Ramit Das**, R. Ramanujam, Sunil Simon. *Reasoning about Social Choice and Games in Monadic Fixed-Point Logic* Proceedings of the 17th TARK 2019: Toulouse, France TARK 2019: 106-120

Journal Publications

1. **Ramit Das**, Anantha Padmanabha, R. Ramanujam. *Implicit quantification for modal reasoning in large games* accepted at *Synthese Journal*. DOI:10.1007/s11229-023-04156-9

Expertise

1. **Mathematical Logic**
   - Expressibility in different logics
   - Game theoretic modelling of social phenomena
   - Understanding of inexpressibility and axiomatisation
2. **Programming Skillsets**
   - Transform groff documents to pdf for short quick notes written as a groff document.
   - Some python projects like a maze solver using a randomised algorithm that has components of building a maze and then trying to solve it.
   - Have dabbled in languages from C, C++, java, prolog, haskell, etc. Currently more fluent in python, latex, processing

Education

- Doctor of Philosophy (Ph.D.)

  The Institute of Mathematical Sciences, Chennai, India
  Discipline : Senior Research Fellow, Theoretical Computer Science
  Advisor : Dr. R. Ramanujam
  Area of Study : Formalisation of Some Pure Strategy Games using Logic, Least Fixed Point Logic, Propositional Dynamic Logic, Large Games, Social Network Games
  Thesis Title : **A Logical Study of the Improvement Graphs formed from Games**
  Status : Thesis submitted and under review
  Duration : Currently Pursuing (2016 -)

- Visitorships

  IIT, Kanpur
  Host : **Dr. Sunil Simon**
  Duration : September 2022 - January 2023

- Master of Science (M.Sc.)

  Chennai Mathematical Institute, Chennai, India
  Discipline : Computer Science. Passed with CGPA 8.44 in 2016.

- Bachelor of Engineering (B.E.)

  Indian Institute of Engineering, Science and Technology, Shibpur, West Bengal, India
  Discipline : Computer Science and Technology. First Class with Honours, 76%, in 2014.

Academic Activities

- Examinations
  - Qualified for the TIFR interviews for TCS in 2016.
  - Qualified for CMI Masters through competitive JEST 2014.
  - Secured a GATE(CSE) rank of 785 in 2014 out of approximately 1 lakh students.
  - Represented my UG in ACM, ICPC India college levels, 2012, 2013.
  - WBJEE state rank of 717 (out of approximately 2.5 lakh students) to bag the UG.

- Talks and Teachings
  - Gave a talk on, An introduction to **Descriptive Complexity** at IIT Kanpur's student seminar series called SIGTACS, in January 2023.
  - Gave a **presentation talk** in a summer school hosted by Council of Scientific and Industrial Research, CSIR, and Central Scientific Instruments Organisation, CSIO, and Ashoka University, India for the Summer Institutes of Computational Social Science, SICSS, 2022. This was an interesting summer school that consisted of participants engaging in **Experimental Game Theory**. It needed us to form a team and submit some preliminary investigation on a problem of our choice. I lead our team for this activity.
  - Gave an **online talk** on basics of descriptive complexity called **Descriptive complexity - An Introduction** at the 21st annual meet of Calcutta Logic Circle, CLC, January, 2022.
  - Gave an **online talk** on the ideas linking **game theory and logic** in a student seminar at IIT Kanpur logic series in 2021.
  - Gave an **online talk** at the *TCS Seminar* series held at *IMSc* itself in 2021 regarding the work presented in the conferences LNGAI and LORI.
  - Gave **online talks** for the LNGAI and LORI conferences on the conference material respectively in 2021.
  - Gave an **offline talk** at the TARK conference held at Toulouse, France in 2019.
  - Gave the **logic and automata tutorials** for the summer school at IMSc during 2018.
  - Talked about the notion of connectivity (**Konigsberg's bridge problem and linked mobius strips when cut**) to school children aimed at promoting women in science in IMSc in 2017.

- Conferences attended and Academic Visits
  - FSTTCS - 2016-20
  - ICLA and ISLA 2016,17,18
  - TARK , LNGAI. LORI - 2019,21
  - Academic visit to Hans Van Ditsmarch in 2019.
  - WACT 2019
  - SAT SMT - 2016,18,19
  - SICSS, 2022 - Summer School held online by Ashoka University & CSIR & CSIO

- Programming proficiency

  Current proficiency would be in **python, latex, processing**
  Since my understanding comes through logic and having self dabbled a bit into different programming languages, I feel confident about picking up any programming language or a framework for the said use. Would like to pick up programming with proof assistants like **coq**.
  Interests are more towards, **reverse engineering**, **codegolfing** - in particular vimgolfing, **obfuscation** and **procedurally generated art, music**.

Non Academic Activities

- Organised the Fresher's Program at IMSc in 2017.

- Hosted the Badminton Tournament at IMSc in 2020

  Had a feel of **real life Game theory** when came up with a **complicated auction mechanism** to distribute players.
  Had a feel of solving a **NP-hard scheduling problem** when solving a conflict free match scheduling problem with given constraints of playable and non playable dates within the tournament line up.
  Also took part in the tournament and won it with the team.

- Designed a process for the servicing of food at the institute during the last covid phase.

  Formalised the mess problem - identified the variables that played an important part in the problem we faced and also understood how they were linked with each other.
  Designed a **constitutional draft** for the mess committee - a committee to be in charge of solving the mess problem which was dynamically going to vary over time. The constitution was supposed to provide the framework within which the solutions to the mess problem could be articulated.
  Successfully **executed** our solution with my team and got good reviews from the then members of the mess.

- Was playing in the winning team at the Football tournament in IMSc in 2019 and the runners up team in 2020.

References

- **Dr. R. Ramanujam**, Retired Professor.

  The Institute of Mathematical Sciences, Chennai - 600 113, India.

  E-mail : jam@imsc.res.in

- **Dr. Sunil Simon**, Assistant Professor.

  IIT, Kanpur - 208 016, India.

  E-mail : simon@cse.iitk.ac.in

- **Dr. Sujata Ghosh**, Associate Professor.

  ISI, Chennai - 600 029, India.

  E-mail : sujata@isichennai.res.in

- **Dr. Abhisekh Sankaran**, Consultant.

  Tata Consultancy Services (TCS),

  Tata Research, Development and Design Centre, Pune - 411013, India

  Email: abhisekh.sankaran@tcs.com

The Institute of Mathematical Sciences, Chennai

(A constituent institution of Homi Bhabha National Institute, Mumbai)

MARKSHEET

Program name: Ph.D.
Student name: Ramit Das

Discipline: Theoretical Computer Science
Enrolment number: MATH10201604001

Semester I: August-December, 2016

Course	Credits	Marks	Grade
Algorithms	7	80	B
Discrete Mathematics	7	82	B
Mathematical Logic	7	85	B
Theory of Computation	7	81	B

Semester II: January-April, 2017

Course	Credits	Marks	Grade
Computational Complexity	7	81	B
Theory of Computation II	7	86	B
Mathematical Logic II	7	84	B
Algebraic Graph Theory	7	95	A
Methodology	4	91	A

Total credits earned: 60
Date: Aug. 30, 2017

Academic Coordinator

PROFESSOR
THE INSTITUTE OF MATHEMATICAL SCIENCES
CHENNAI - 600 113.

Dean Academic
Mathematical Sciences

Dean
The Institute of Mathematical Sciences
a Constituent Institution
Homi Bhabha National Institute

CHENNAI MATHEMATICAL INSTITUTE

http://www.cmi.ac.in

National Graduate Programme in Mathematical Sciences

M.Sc. in Computer Science

Academic Transcript (2014–2016)

Name: Ramit Das
Roll No.: MCS201410

Date of Birth: 15 September, 1991
Date of Admission: 2014, August

Year	Semester	Course	Grade	Credits
2014 (Aug-Nov)	I	Basic Programming Languages	AB	4
		Design & Analysis of Algorithms	C	4
		Discrete Mathematics	B	4
		Theory of Computation	B	4
2015 (Jan-Apr)	II	Complexity Theory	B	4
		Mathematical Logic	AB	4
		Programming Language Concepts	AB	4
		Quantitative Automata Theory	B	4
2015 (Aug-Nov)	III	Linear Programming & Combinatorial Optimization	B	4
		Logic, Automata & Games	C	4
		Randomness in Computation	A	4
		Online & Approximation Algorithms	C	4
2016 (Jan-Apr)	IV	Thesis	A	16

†*Not for CGPA*

Cumulative Grade Point Average: 08.44

Madhavan Mukund
Dean of Studies
Chennai Mathematical Institute

Chennai Mathematical Institute Siruseri 603 103.

Rajeeva L Karandikar
Director
Chennai Mathematical Institute