

Rajaraman Lecture Series in the Department of Computer Science and Engineering. Our speakers of this series are considered to be the master of a domain of computer science - an outstanding and passionate researcher who also has the skill of explaining difficult concepts in an easy and engaging manner. The aim of each lecture will be to address one or more of the following aspects of research in computer science.

- (1) An elegant solution to a research problem
- (2) The impact of research in the real world
- (3) Recent research trends in a specific domain of computer science

The next lecture of this series will be in the domain of **LOGIC**. The speaker will be **Prof. Supratik Chakraborty** from IIT Bombay.

It will be held at **5:15 PM**, on **Tuesday, 29th September**. The venue will be **RM101**.

Find below the title & abstract of the lecture and a brief bio of the speaker.

Title: When Theory Meets Practice: Logical Reasoning at Scale

Abstract:

Logic has been one of the bedrocks of Computer Science since its earliest days, and hardly an area of the discipline has remained untouched by logic-based reasoning. Yet automating formal reasoning based on logic at scale has proved remarkably difficult. A solver or decision procedure that looks promising in theory may fail to scale in practice, while an automated reasoning tool that performs impressively on real problems may offer few mathematically rigorous or meaningful guarantees.

In this talk, I will discuss a few important problems in logical reasoning where theory and practice have informed—and sometimes challenged—each other. This interplay has led to methods that scale to real-world problems, offer rigorous and meaningful guarantees, and deepen our understanding of computation itself.

The choice of problems is necessarily shaped by my own interests and limitations. I will focus on propositional satisfiability solving, model counting, and functional synthesis, and conclude with some observations on the role of formal reasoning in the age of agentic AI.

Bio:

Supratik Chakraborty is Bajaj Group **Chair Professor** of Computer Science and Engineering at IIT Bombay, where he has been on the faculty since 2000. His research interests lie at the intersection of theoretical and applied formal methods, with a focus on developing logical reasoning algorithms with strong guarantees that also scale in practice. He is a **Fellow of Indian National Academy of Engineering**, a **Distinguished Member of ACM**, and a **Distinguished Alumnus of IIT Kharagpur**.

Anyone with/without any background will surely like this lecture since it is about Logic.