NCTS
National Center for Theoretical Sciences

Interdisciplinary Distinguished Lectures

Invited Speaker

Venkatesan Guruswami
University of California, Berkeley

Agenda

13:00-13:30 Registration
13:30-15:00 Lecture (1.5hr)
15:00-15:30 Tea Time

Date 2025/12/24

Venue R515, Cosmology Bldg., NTU

Biosketch

Venkatesan Guruswami is a Chancellor's Professor of Electrical Engineering and Computer Science, Professor of Mathematics, and Director of the Simons Institute for the Theory of Computing at the University of California, Berkeley. He received his undergraduate degree at IIT Madras and his doctorate from MIT. Venkat is a theoretical computer scientist with research interests spanning error correction, approximate optimization, and computational complexity, He currently serves as the Editor-in-Chief of the Journal of the ACM. A fellow of the ACM, IEEE, and AMS, his recognitions include the Presburger Award, a Simons Investigator award, Guggenheim, Packard and Sloan Fellowships, and a distinguished alumnus award from IIT Madras.

Organizers

Mao-Pei Tsui
National Taiwan University

Hsin-Po Wang
National Taiwan University

Title

Coding Theory: Error-Resilience via Judicious Redundancy

Abstract

When we communicate or store large volumes of data, that information is inevitably subject to errors introduced by various forms of noise and interference. Yet, remarkably, we routinely take seamless and reliable digital communication for granted, a foundation without which modern society could not function. At the core of this resilience are error-correcting codes---mathematical constructs that impose judiciously tailored redundancies on the data to ensure that errors, within anticipated limits, can be quickly detected and corrected.

The talk will offer a gentle introduction to error-correcting codes and the basic principles behind them, highlight some well-known constructions, and showcase a few applications in communication and beyond. Time permitting, we may also touch upon quantum error-correction, which presents unique challenges central to the realization of practical quantum computers.

Contact

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