Title: Optimization and Sampling Under Symmetry

Speaker: Professor Nisheeth Vishnoi, A. Bartlett Giamatti Professor of Computer Science at Yale University

Date and time: 23rd June 2022 (Thursday), 10 AM

Venue: Room 101, H R Kadim Diwan Building (KD 101), CSE Department

Seminar link details for joining online: https://iitk-ac-in.zoom.us/j/97748687493?pwd=OVVmYlcwS3JuNk5BNWtXV1liV29sUT09

Abstract:

In the last few years, the notion of symmetry has provided a powerful and essential lens to view several optimization or sampling problems that arise in areas such as theoretical computer science, statistics, machine learning, quantum inference, and privacy. In this talk, I will present two examples of nonconvex problems in optimization and sampling where continuous symmetries play -- implicitly or explicitly -- a key role in the development of efficient algorithms. These examples rely on deep and hidden connections between nonconvex symmetric manifolds and convex polytopes, and are heavily generalizable (using tools from Lie theory). We will also reflect on why symmetry may arise in optimization and sampling problems.

Speaker bio:

Nisheeth Vishnoi is the A. Bartlett Giamatti Professor of Computer Science and a co-founder of the Computation and Society Initiative at Yale University. He studies the foundations of computation, and his research spans several areas of theoretical computer science, optimization, and machine learning. He is also interested in understanding nature and society from a computational viewpoint. Here, his current focus includes studying entropy, the emergence of intelligent behavior, and ethical problems at the interface of artificial intelligence and society.

Professor Vishnoi was the recipient of the Best Paper Award at IEEE Symposium on Foundations of Computer Science in 2005, the IBM Research Pat Goldberg Memorial Award in 2006, the Indian National Science Academy Young Scientist Award in 2011, the IIT Bombay Young Alumni Achievers Award in 2016, and the Best Paper award at ACM Conference on Fairness, Accountability, and Transparency in 2019. He was named an ACM Fellow in 2019. His most recent book Algorithms for Convex Optimization was published by Cambridge University Press.