Eyes-on-Research Lecture Series on Computer Science and Engineering

Title: Robust Query Processing: Where Geometry Beats ML!

Speaker: Professor Jayant R. Haritsa, a renowned researcher in Database Systems

Venue: RM 101

Date: 4th March 2025 (Tuesday)

Time: 5:10 PM

Abstract

Over the past half-century, declarative query processing techniques have been a foundational topic in relational database research. Yet the solutions have largely remained a "black art" due to the inherent complexities of such processing. The situation is particularly problematic since performance degradation in database queries can reach orders of magnitude compared to an oracular ideal.

Recent efforts have sought to address the challenge afresh from first principles, focusing on two key approaches: (a) learning techniques for predicting query performance, and (b) geometric strategies for leveraging execution plan trajectories in parameter space. While data-driven models dominate the literature, we will argue that basic geometric properties such as monotonicity, concavity, and bou nded slopes, can be leveraged to deliver superior solutions with stron g, quantifiable guarantees on runtime performance.

Biodata of the Speaker

Professor Jayant R. Haritsa is a renowned researcher in Database Systems. He has been on the computer science faculty at Indian Institute of Science, Bangalore, since 1993. He received a BTech degree from the Indian Institute of Technology (Madras), and the MS and the PhD degrees from University of Wisconsin (Madison). He was awarded the **Shanti Swarup Bhatnagar Prize in 2009** and the **Infosys Prize in 2014**. He is a **Fellow of ACM** and **IEEE** for his contributions to database engine design and analysis.