



ACM Fellow Distinguished Lecture

Trust in the Untrusted World?

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Hosts: Shantanu Sharma and Vincent Oria

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Coffee: 2:15 PM – 2:30 PM

Time: 2:30 PM – 3:30 PM

Location: GITC 1100 (1st floor Seminar Lecture Hall)

Zoom Link: <https://njit-edu.zoom.us/j/95261139442?pwd=TI76hgN5qZMAaM4z83Lo0YD1FctiNX.1>

Abstract:

We live in interesting times in that our digital lives have become increasingly interdependent and interconnected. Such interconnections rely on a vast network of multiple actors whose trustworthiness is not always guaranteed. Over the past three decades, rapid advances in computing and communication technologies have enabled billions of users with access to information and connectivity at their fingertips. Unfortunately, this rapid digitization of our personal lives is also now vulnerable to invasion of privacy. In particular, now we have to worry about the malicious intent of individual actors in the network as well as large and powerful organizations such as service providers and nation states. In the backdrop of this reality of the untrusted world, we raise the following research questions: (i) Can we design a scalable infrastructure for voice communication that will hide the knowledge of who is communicating with whom? (ii) Can we design a scalable system for oblivious search for documents from public repositories? (iii) Can we develop scalable solutions for private query processings over public databases? These are some of the iconic problems that must be solved before we can embark on building trusted platforms and services over untrusted infrastructures. In this talk, we present a detailed overview of a system for voice communication that hides communication metadata over fully untrusted infrastructures and scales to tens of thousands of users. We also note that solutions to the above problems rely on an intermediary service provider. We conclude this talk with an open question on the efficacy of a decentralized paradigm for cryptocurrency in the broader context of our digital lives that can potentially eliminate the need for an intermediary in provisioning trusted services and platforms.

Bio:



Divy Agrawal is a Distinguished Professor and Chair of Computer Science at the University of California at Santa Barbara. He also holds the Leadership Endowed Chair in the Department of Computer Science at UCSB. He received BE(Hons) from BITS Pilani in Electrical Engineering and then received MS and PhD degrees in Computer Science from State University of New York at Stony Brook. Since 1987, he has been on the faculty of computer science at the University of California at Santa Barbara. His research expertise is in the areas of databases, distributed systems, cloud computing, and big data infrastructures and analysis. Over the course of his career, he has published more than 400 research articles and has mentored approximately 50 PhD students. He serves as Editor-in-Chief of the Proceedings of the ACM on Modeling of Data and Springer journal on Distributed and Parallel Databases and has either served or is serving on several Editorial Boards including ACM Transactions on Databases, IEEE Transactions on Data and Knowledge Engineering, ACM Transaction on Spatial Algorithms and Systems, ACM Books, and the VLDB Journal. He served as a Trustee on the VLDB Endowment and is currently serving

as the Chair of ACM Special Interest Group on Management of Data (ACM SIGMOD).

He received a Gold Medal from BITS Pilani. Professor Agrawal is the recipient of the UCSB Academic Senate Award for Outstanding Graduate Mentoring. He and his co-authors are recipients of best paper awards (ICDE 2002, MDM 2011), influential paper (NDSS 2024), and test-of-time awards (ICDT, MDM). He is a Fellow of the ACM, the IEEE, and the AAAS.