ISTeC
The Information Science and Technology Center

Colorado State University

Distinguished Lectures
Spring 2018

Colorado State University's Information Science and Technology Center (ISTeC) *presents two lectures by*

Dr. Prashant Shenoy
Professor
College of Information and Computer Sciences
University of Massachusetts, Amherst

ISTeC Distinguished Lecture

In conjunction with the Department of Electrical and Computer Engineering Seminar Series

Towards a Software-defined Infrastructure for Smart IoT Systems

Monday, March 26, 2018
Reception with refreshments: 10:30 a.m.
Lecture: 11:00 a.m.-12:00 noon
Morgan Library Event Hall

Department of Electrical and Computer Engineering Seminar Series
Sponsored by ISTeC

Designing Systems and Applications for Transient Computing

Monday, March 26, 2018
Lecture: 3:00-4:00 p.m.
Lory Student Center Room 376

Abstracts

Towards A Software-defined Infrastructure for Smart IoT Systems

Today smart IoT devices, sensor data analytics, and associated smart technologies have begun to permeate through every aspect of our society. This has led to the emergence of smart and connected communities as well as individual applications domains such as smart buildings, smart health, smart vehicles, and others. In this talk, I will argue the need for a software-defined infrastructure for flexible monitoring, analysis, and control in such systems. I will draw upon examples from smart buildings and related domains to describe how such a software-defined infrastructure can be used, in conjunction with data-driven techniques, to build flexible smart systems and applications. I will end with a discussion of how computer science and networking principles continue to be used as an inspiration for building the next-generation of smart IoT systems.

Designing Systems and Applications for Transient Computing Second

Traditional distributed systems are built under the assumption that system resources will be available for use by applications unless there is a failure. Transient computing is a new phenomena that challenges this assumption by allowing system resources to become unavailable at any time. Transiency arises in many domains such as cloud computing—in the form of revocable spot servers–and in data centers that rely on variable electricity prices or intermittent renewable sources of energy Transiency is inherently different from fault tolerance since resources do not fail, rather they become temporarily unavailable, and traditional fault tolerance mechanisms are not suitable for handling transient resource unavailability.

In this talk, I will discuss how systems and applications need to be rethought to run on transient computing systems. I will first describe a system called Yank that uses a new bounded-time virtual machine migration mechanism to handle transiency at a system level while being transparent to applications. I will then discuss how modern distributed applications can be made transiency-aware and present a Spark-variant called Flint that we have developed to exploit transient cloud computing. I will end with open research questions in this area and directions for future work.

Speaker Biography

Prashant Shenoy is currently a Professor and Associate Dean in the College of Information and Computer Sciences at the University of Massachusetts Amherst. He received the B.Tech degree in Computer Science and Engineering from the Indian Institute of Technology, Bombay and the M.S. and Ph.D degrees in Computer Science from the University of Texas, Austin. His research interests lie in distributed systems and networking, with a recent emphasis on cloud and green computing. He has been the recipient of several best paper awards at leading conferences, including a Sigmetrics Test of Time Award. He serves on editorial boards of the several journals and has served as the program chair of over a dozen ACM and IEEE conferences. He is a fellow of the IEEE and the AAAS and a distinguished member of the ACM.

To arrange a meeting with the speaker, please contact Anura Jayasuma (Anura.Jayasumana@colostate.edu).

Upcoming Distinguished Lectures

April 2
Copyrights and Copyfights: Intellectual Property and Ethics in Digital Spaces
11:00 a.m.-12:00 noon

Morgan Library Event Hall
Dr. Danielle Nicole Devoss

April 23
Networks of 'Things'
11:00 a.m.-12:00 noon

Morgan Library Event Hall
Dr. Jeffrey M. Voas