Electrical & Computer ENGINEERING

ENERGY AND INFORMATION SEMINAR
eis.ece.cmu.edu

Thurs, Apr. 2nd
Roberts Hall Room 240 at 11:30 a.m.

Riemannian computing in computer vision: Applications to human activities, dynamic textures, and beyond

Dr. Pavan Turaga
Arizona State University

Pavan Turaga is Assistant Professor jointly with the School of Arts, Media, Engineering, and Electrical Engineering at Arizona State University. He received the B.Tech. degree in electronics and communication engineering from the Indian Institute of Technology Guwahati, India, in 2004, and the M.S. and Ph.D. degrees in electrical engineering from the University of Maryland, College Park in 2008 and 2009 respectively. He then spent two years as a research associate at the Center for Automation Research, University of Maryland, College Park. His research interests are in computer vision and machine learning with current focus on dynamical modeling and differential geometry, with applications to human activity analysis, dynamic scene analysis, and portable technologies for health and well-being interventions. Turaga received the National Science Foundation's CAREER award in 2015. He was awarded the Distinguished Dissertation Fellowship in 2009 by the Univ. of Maryland, and was selected to participate in the Emerging Leaders in Multimedia Workshop by IBM, New York, in 2008. He is a Senior Member of the IEEE and chapter chair of the IEEE SPCOM Phoenix chapter.

Abstract: Spatio-temporal patterns abound in the real world, and understanding them computationally holds the promise of enabling a large class of applications in video surveillance, mobile health, biometrics, computer graphics and animation. In this talk, we discuss models describing spatio-temporal patterns in images, videos, and sensor data with a focus on non-Euclidean geometric constraints for a wide range of applications. Using several examples, we motivate the study of geometric techniques which are more commonly used in applied mathematics for imaging and vision problems. Among the examples, we discuss first order Gauss-Markov processes as simple yet powerful models to describe the space of dynamical primitives. We show how to use the differential geometric properties of this primitive-space to devise effective inference algorithms, for applications in activity recognition and pattern discovery from long videos. We further illustrate the broader impact of differential geometric computing and tools developed in this agenda for several image-based recognition problems such as shape analysis, object recognition, video-based face recognition, and age-estimation from facial features.

ECE Energy and Information Seminar Hosts
Pulkit Grover <pulkit@cmu.edu>
Marija Ilic <milic@ece.cmu.edu>
Soummya Kar <soummyak@ece.cmu.edu>
José Moura <moura@ece.cmu.edu>
Rohti Negi <negi@ece.cmu.edu>

Student Coordinators
June Zhang <junez@andrew.cmu.edu>
Jonathan Mei <jmei@cmu.edu>

Electrical & Computer ENGINEERING
Carnegie Mellon University