Data-Driven Dynamic Networked Systems

Organizer:

Ricardo Sanfelice, Computer Engineering, UCSC

Speakers:

Marco Pavone, Aero/Astro, Stanford John Musacchio, TIM Program, UCSC Katia Obraczka, Computer Engineering, UCSC Stefano Carpin, Computer Science and Engineering, UCM Lise Getoor, Computer Science, UCSC

https://hybrid.soe.ucsc.edu/dddns

Models, Algorithms, and Evaluation for Autonomous Mobility-On-Demand Systems

Marco Pavone Autonomous Systems Laboratory Department of Aeronautics and Astronautics Stanford University

First Annual CROSS Research Symposium

October 24, 2016







Challenges of Implementing Incentive Mechanisms for Reducing Infrastructure Congestion







Incentives to shift Demand?





How to make people shift?

- More complex congestion-based incentives / pricing needed
- Possibly more complex tracking of behavior
- Possibly more interactivity with users
- Concerns: Security? Privacy? ...

John Musacchio Professor, TIM Program, UCSC

Towards the Internets of the Future

Katia Obraczka

Computer Engineering UC Santa Cruz http://www.soe.ucsc.edu/~katia http://inrg.cse.ucsc.edu katia@soe.ucsc.edu



From Distributed Robotics to Cloud Robotics Stefano Carpin, University of California, Merced

http://robotics.ucmerced.edu

- Cloud computing opens new opportunities for virtually every robotic application.
- Traditional distributed approaches should be rethought to take advantage of pervasive connectivity, elastic computing, and massive data storage.
- Selected applications in industrial and field robotics will be illustrated.
- Challenges and opportunities will be outlined.







Scalable Collective Reasoning in Networks Prof Lise Getoor, UC Santa Cruz

- Probabilistic Soft Logic (PSL) is a probabilistic programming language designed for collective reasoning in large scale graphs and networks.
- Inference in PSL translates into convex optimization problem -> inference is really fast
- Inference further enhanced with state-of-the-art optimization and distributed processing paradigms such as ADMM & GraphLab
- Outperforms existing SOTA probabilistic frameworks
- Learning methods for rule weights & latent variables
- PSL is *flexible*: activity recognition, stance-detection, sentiment analysis, drug target prediction, latent social groups and trust, engagement modeling, ontology alignment, knowledge graphs, hybrid recommenders, and looking for more!
- PSL is open-source, code, data, tutorials available online



WORKSHOPS

	I. <u>Secure, Real-time Sharing of Cancer</u> <u>Gene Information</u>	II. <u>Data-Driven Dynamic Networked</u> <u>Systems</u>
	Chair: Rob Currie	Chair: Ricardo Sanfelice
	Simularium, E2-180	Engineering 2, 5 TH Floor, Room 599
10:30-12:00 Session I	 The Cancer Gene Trust (<i>Rob Currie</i>, UCSC) ADAM (<i>Frank A Nothaft, UC Berkeley</i>) 	 Models, Algorithms, and Evaluation for Autonomous Mobility-On-Demand Systems (<i>Marco Pavone, Stanford</i>) Challenges of Implementing Incentive Mechanisms for Reducing Infrastructure Congestion (<i>John Mussachio, UCSC</i>) Towards the Internets of the Future (<i>Katia Obraczka, UCSC</i>)
12:00-1:30	LUNCH – Catered by Falafel of Santa Cruz - Lower Engineering Courtyard	
1:30-3:00 Session II	 Toil (Hannes Schmidt, UCSC) UCSC Genomics Core Architecture (Brian O'Connor, UCSC) Smart Storage in Genomics (Carlos Maltzahn, UCSC) 	 From Distributed Robotics to Cloud Robotics, (Stefano Carpin, UC Merced) Scalable Collective Reasoning over Network Data (Lise Getoor, UCSC)