

Individual Vehicle Autonomy: Perception and Control

OCTOBER 5 - 9, 2020

Scientific Overview

Modern automated vehicle platforms combine large volumes of data into decisions using techniques that are increasingly powered via artificial intelligence that learn and change over time. Artificial intelligence techniques have provided several breakthroughs to bring forth automated vehicles that, in demonstrations, can be shown to operate similar to human drivers. Challenges include: 1) interpretability of decision making; 2) safety for data-driven systems; 3) robustness of machine learning algorithms; 4) development of reinforcement learning algorithms. In addition, there is no established notion of what precisely constitutes safe, efficient, or even natural driving.

This workshop will bring together researchers working on the theoretical sides of deep learning techniques for perception and control of automated vehicles, researchers interested in assuring these autonomous systems operate with safety guarantees, and experts in sensing and imaging technology. Additional themes addressed in this workshop include interactions between vehicle sensing and the infrastructure, and cybersecurity aspects related to sensing and machine learning.

This workshop will include a poster session; a request for posters will be sent to registered participants in advance of the workshop.

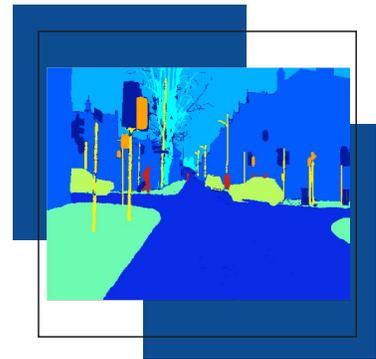
Long Program Schedule

This workshop is part of the long program on "Mathematical Challenges and Opportunities for Autonomous Vehicles."

- Autonomous Vehicles Opening Day : September 14, 2020
- Mathematical Challenges and Opportunities for Autonomous Vehicles Tutorials : September 15 - 18, 2020
- **Workshop I: Individual Vehicle Autonomy: Perception and Control : October 5 - 9, 2020**
- Workshop II: Safe Operation of Connected and Autonomous Vehicle Fleets : October 26 - 30, 2020
- Workshop III: Large Scale Autonomy: Connectivity and Mobility Networks : November 16 - 20, 2020
- Workshop IV: Social Dynamics beyond Vehicle Autonomy : November 30 - December 4, 2020
- Autonomous Vehicles Culminating Retreat at Lake Arrowhead : December 13 - 18, 2020

Participation

Additional information about this workshop including links to register and to apply for funding, can be found on the webpage listed below. Encouraging the careers of women and minority mathematicians and scientists is an important component of IPAM's mission, and we welcome their applications.



Organizers

Wolfram Burgard (University of Freiburg), Jana Kosecka (GMU), Adam Oberman (McGill), and Stefano Soatto (UCLA).

Speakers

Alexandre Alahi (EPFL), Dragomir Anguelov (Waymo), Shai Avidan (Tel Aviv University), Alper Ayvaci (Waymo), Oscar Beijbom (APTIV), Wolfram Burgard (University of Freiburg), Pratik Chaudhari (UPenn), Xuan Di (Columbia University), Adrien Gaidon (Toyota Research Institute), David Held (CMU), Matthew Johnson-Roberson (Umich), Sertac Karaman (MIT), Jana Kosecka (GMU), Bastian Leibe (RWTH Aachen University), Bo Li (University of Illinois), Dorsa Sadigh (Stanford), Stefano Soatto (UCLA), Richard Tsai (UT Austin), Raquel Urtasun (University of Toronto), Luc Vincent (Lyft), and Vlad Voroninski (Helm AI).



For more information, visit the program webpage:
www.ipam.ucla.edu/awws1