Sensing, Cooperation and Control in Networked Systems
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This talk will explore the current state of the art of using cameras with mobile ground and air sensing systems such as robotics and UAVs, including lessons learned and future challenges and applications. The first example is a single, large scale, robot with many sensors such as lidar, radar, and cameras used to drive autonomously. Cameras were selectively used in this system to localize the vehicle, and fuse with other sensors to track other cars. Sensor modalities and synchronization of the large amounts of data were key issue. A second set of examples are cooperative robotics for missions such as search and mapping using lidar and vision. Key elements include common representations for sharing and sensor fusion. Finally, a cooperative UAV example is given, where two UAVs tracked stationary and moving targets on the ground using only cameras. Key elements include the feedback control loops, and sharing of information across the network in the presence of data losses.