This talk will describe a variety of methods that have been developed for the purposes of understanding group level social behaviors using stand-off video surveillance methods. Three main topics are considered: 1) the GE Sherlock System: a comprehensive approach to capturing and analyzing non-verbal cues of persons in crowd/group level interactions, 2) One Shot Learning: a new approach to crowd level behavior recognition based on the concept that a new behavior can be recognized with as little as a single example and 3) Agent Based Inference: a novel approach to the analysis of individual cognitive states of persons interacting in a group or crowd level social interactions. The talk starts with a description of the GE Sherlock system which encompasses methods such as person tracking in crowds, dynamic PTZ camera control, facial analytics from a distance such as gaze estimation and expression recognition, upper body affective pose analysis and the inference of social states such as rapport and hostility. The talk then discusses how cues derived from the Sherlock system can be used to construct semantically meaningful behavior descriptors or affects allowing for signature matching between behaviors which can be viewed as a form of one shot learning. Going beyond affects based on direct observation, we argue that more meaningful affects can be constructed via the inference of the cognitive states of each individual. To this end we introduce the Agent Based Inference framework. The talk concludes with a discussion of how such methods are making their way into commercial use via efforts such as the intelligent city, the intelligent airport and the intelligent hospital.

FULL BIO: https://events.columbia.edu/go/ge_PeterTu

How the New Availability of Urban and Industrial Data are Impacting Our World from Public Safety to Jet Engines

This talk discusses how newly available data from cities and industry, from sensing and activities, and from transactions and services are driving change across our world. Cities are increasingly using data to drive new efficiencies and insights in the urban world. For example, policing and public safety services are ever-more data-driven and transparent with data being more widely distributed than at any point in the past. Similarly, industry is changing from being traditionally physical into becoming more digital through the distribution of data. New availability of sensing data through the emerging Industrial Internet of Things (IIoT), for example, is allowing for increasing levels of predictive maintenance and qualities of service. Highly personalized healthcare is now possible because of data being made available digitally from everywhere from our worn devices to imaging of our bodies to our genetics themselves.

This discussion will draw on General Electric’s activities driving the Industrial Internet of Things (IIoT) and Predix, as well as from leading cities like Los Angeles, Singapore, and Dubai. We will touch upon technologies such as machine learning (AI) and other types of analytics, as well as computer vision (CV), connectivity (5G and private LTE), and mixed reality.

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