Tata Institute of Fundamental Research

Homi Bhabha Road, Colaba, Mumbai, INDIA, 400005

IEEE SPS Distinguished Lecture – Special ASET Colloquium

Privacy-Preserving Localization and Recognition of Human Activities

Smart rooms, that respond to occupant behavior, will likely become a common occurrence in our lifetimes. With advanced sensors, processors and algorithms, such rooms are expected to save energy and provide productivity as well as health benefits. Indoor localization of occupants and recognition of their activities are two key components of this vision. However, traditional camera-based systems may not be acceptable in privacy-sensitive scenarios since high-resolution images may reveal room details and occupant identity to eavesdroppers. I will first review traditional approaches to protecting occupant's visual privacy, including reversible methods (e.g., data scrambling) and irreversible methods (e.g., optical and digital obfuscation of visual data). Then, I will describe computational solutions via resolution reduction recently developed at Boston University. In one approach, a small network of ceiling-mounted, single-pixel RGB sensors collects visual data from which occupant's location is estimated by means of advanced algorithms. In another approach, extremely low resolution videos (e.g., 16 × 12 pixels) are used to recognize occupant's activities. Finally, I will discuss visual privacy protection by replacing the identity information in a person's image with another identity by means of variational generative-adversarial networks (VGANs).

Prof. Janusz Konrad (Boston University, USA)

Janusz Konrad received Master's degree from Technical University of Szczecin, Poland in 1980 and PhD degree from McGill University, Montréal, Canada in 1984. He joined INRS-Télécommunications, Montréal as a post-doctoral fellow and, since 1992, as a faculty member. Since 2000, he has been on faculty at Boston University. He is an IEEE Fellow and a recipient of several IEEE and EURASIP Best Paper awards. He has been actively engaged in the IEEE Signal Processing Society as a member of various boards and technical committees, as well as an organizer of conferences. He has also been on editorial boards of various EURASIP journals. His research interests include video processing and computer vision, stereoscopic and 3-D imaging and displays, visual sensor networks, human-computer interfaces, and cybersecurity.

This talk is open to all. No prior registration is needed. Please carry your photo ID card. For further details, email to 'aset@tifr.res.in' or call +91-9987537702.

Date & Time: **Monday, 13th January 2020, 4pm**

Venue: **D-Block Conference Room (D-406), TIFR, Mumbai**

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