

KEYNOTE TALK
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Moving Object Detection and Tracking in Wide Area Motion Imagery

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Abstract

Detection and tracking of moving objects in wide area motion imagery (WAMI) is challenging as the size of the objects in the image is too small and they appear at different views and in varying environmental conditions. We present a new framework for detection and tracking of such low resolution objects in WAMI data. The strategy behind the development of this algorithm is to utilize the entire information that is available about the objects of interest in the detection and tracking processes. The proposed method makes use of a dense version of localized histogram of gradients on the difference images. A Kalman filter based predictive mechanism is employed in the tracking methodology. The feature based tracking mechanism is capable of successfully tracking moving objects in the scene. The robustness of the proposed methodology in detection and tracking objects of interest is illustrated by performing several experiments on WAMI data captured at a height of around 7000 feet above ground. It is observed that the new method can even track pedestrians in the above WAMI data. We also present the effect of our shadow illumination and super-resolution techniques to improve object detection and tracking accuracy.



Speaker Bio-Sketch: Dr. Vijayan Asari is a Professor in Electrical and Computer Engineering and Ohio Research Scholars Endowed Chair in Wide Area Surveillance at the University of Dayton, Dayton, Ohio. He is the director of the Computer Vision and Wide Area Surveillance Laboratory (UD Vision Lab) at UD. Dr. Asari received his Bachelor's degree in electronics and communication engineering from the University of Kerala, India in 1978, M Tech and PhD degrees in electrical engineering from the Indian Institute of Technology, Madras in 1984 and 1994 respectively. Prior to joining UD in February 2010, Dr. Asari worked as Professor in Electrical and Computer Engineering at Old Dominion University, Norfolk, Virginia, Research Fellow at National University of Singapore and Nanyang Technological University, Singapore and Assistant Professor at University of Kerala, India. He received several teaching, research and advising awards

while at ODU. Dr. Asari holds two patents and has published more than 320 research papers, including 64 peer-reviewed journal papers in the areas of image processing, computer vision, machine learning, pattern recognition, and high performance digital architectures. Dr. Asari is a Senior Member of IEEE and SPIE.