

Perception and Computer Vision with Alternate Sensors

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Cutting edge advances and state-of-the-art work is being made in the growing field of computer vision and pattern recognition beyond the visible spectrum. The computer vision community has typically focused mostly on the development of vision algorithms for object detection, tracking, and classification associated with visible range sensors in day and office-like environments. In the last decade, infrared (IR), depth, IMU, thermal and other non-visible imaging sensors are advancing rapidly and the sensor cost is dropping dramatically. In order to develop robust and accurate vision-based systems that operate beyond the visible spectrum, not only existing methods and algorithms originally developed for the visible range should be improved and adapted, but also entirely new algorithms that consider the potential advantages of non-visible ranges are certainly required. This talk explains three of the applications of computer vision outside of the visible spectrum, including their use in robotic perception, video game interaction, and medical imaging.

Bio:

Dave Tahmoush's primary research has been in medical and radar imaging, databases, and analysis. He published a book in 2014 and edited a successful journal special issue in 2015. He is an experienced grant writer with grants above \$1200K, and an effective teacher with a teaching award. He was a Fulbright scholar and 'Top Young Radar Engineer' with degrees from Caltech, MIT, and the University of Maryland. He was a principal investigator for robotic perception (ladar, video, radar) in human teaming with emphasis on real-time analysis of human activities and ontological analysis. He also researched pedestrian and vehicle tracking and counting, as well as multi-sensor performance. He designed and produced a mammogram analysis system for diagnosing breast cancer including determination of asymmetry which outperformed both commercial and academic systems at image prescreening.