14th IEEE Workshop on Perception Beyond the Visible Spectrum

PBVS 2018

In Conjunction with

CVPR 2018
Salt Lake City

Salt Lake City, Utah, USA - June 18, 2018

Call for Papers

The objective of this workshop is to highlight cutting edge advances and state-of-the-art work being made in the exponentially growing field of PBVS (previously "Object Tracking & Classification Beyond the Visible Spectrum" - OTCBVS) integrating sensor processing, algorithms, and applications. PBVS involves deep theoretical research in sub-areas of image processing, machine vision, pattern recognition, machine learning, robotics, and augmented reality within and beyond the visible spectrum. Advancing vision-based systems includes frameworks and methods featured in PBVS.

The computer vision community has typically focused mostly on the development of vision algorithms for object detection, tracking, and classification with visible range sensors in day and office-like environments. In the last decade, infrared (IR), depth, thermal and other non-visible imaging sensors were used only in special area like medicine and defense. The relatively lower interest level in those sensory areas in comparison to computer vision was due in part to their high cost, low resolutions, poor image quality, lack of widely available data sets, and/or lack of consideration of the potential advantages of the non-visible part of the spectrum. These historical objections are becoming overcome as sensory technology is advancing rapidly and the sensor cost is dropping dramatically. Image sensing devices with high dynamic range and IR sensitivity have started to appear in a growing number of applications ranging from defense and automotive domains to home and office security. In addition, mobile hyperspectral and mm-wave sensors are also coming into existence.

In order to develop robust and accurate vision-based systems that operate in and 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. The fusion of visible and non-visible ranges, like radar and IR images, depth images or IMU information, or thermal and visible spectrum images as well as acoustic images, is another dimension to explore for higher performance of vision-based systems. For example, non-visible light is widely employed in night vision-based systems, and many detection and recognition systems available today rely on physiological phenomena produced by IR and thermal wavelengths. Using artificially controlled lights is a practical solution to eliminate challenging ambient light effects. In active imaging for example, near or short-wave IR laser illumination can even be utilized to see through dust/fog.

This **14th IEEE CVPR WS** on Perception Beyond the Visible Spectrum (**PBVS'2018**) fosters connections between communities in the machine vision world ranging from public research institutes to private, defense, and federal laboratories. PBVS brings together academic pioneers, industrial and defense researchers and engineers in the field of computer vision, image analysis, pattern recognition, machine learning, signal processing, artificial intelligence, sensor exploitation, and HCI.

Organization

Organizer and Program Chair
Dr. Riad I. Hammoud
BAE Systems, USA

Program Co-Chair
Dr. Michael Teutsch
Hensoldt Optronics, Germany

Publication Co-Chair
Dr. Yi Ding
Gemalto, USA

Advisory Committees
Dr. Erik Blasch
Air Force Research Lab, USA
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Lockheed Martin Corp, USA
Prof. Haibin Ling
Temple University, USA
Prof. Guoliang Fan
Oklahoma State University, USA
Dr. Behzad Kamgar-Parsi
Office of Naval Research, USA

Keynote Speakers
Dr. Ian Goodfellow
Google Brain, USA
Dr. Dimitris G. Manolakis
MIT Lincoln Laboratory, USA
Prof. Sabine Süsstrunk
EPFL, Switzerland

Important Dates

- **Submission: March 4, 2018**
- Notification: **March 18, 2018**
- Camera ready: **April 20, 2018**
- WS day: **June 18, 2018**

Topics of Interests

Sensing/Imaging Technologies

- *IR/EO/RGBD imaging systems*
- *Underwater sensing*
- *Multi-spectral/Satellite imaging*
- *Spectroscopy/Microscopy imaging*
- *LIDAR/LDV sensing*
- *Compressive sensing*
- *RADAR/SAR imaging*
- *Radiation sensing*
- *Active Imaging; Cooperative Sensing*

Applications & Systems

- *Surveillance and reconnaissance systems*
- *Unmanned autonomous Systems*
- *Vehicle, Ship, object classification*
- *Robotic grasping*
- *Vision-aided navigation and SLAM*
- *Night/Shadow vision*
- *Sensing for agriculture and food safety*
- *Vision-based autonomous aerial vehicles*
- *Lifelong & Robust Machine Learning*

Theory and Algorithms

- *Deep learning, Reinforcement Learning*
- *Imagery/Video exploitation*
- *Object/Target tracking and recognition*
- *Feature extraction and matching*
- *Activity/Pattern learning and recognition*
- *Multimodal/Multi-sensor/INT fusion*
- *Multimodal Geo-registration*
- *3D Reconstruction and Shape modeling*
- *Automatic Caption Generation; Data Labeling*

Visit www.otcbvs.com to download our IR/thermal datasets, submit questions/suggestions and for the latest announcements