Prof. Yongqiang Zhao
Tongji Universtity, China

Dr. Zhao is professor of Northwestern Polytechnical University School of Automation. Postdoctoral fellow at McMaster University in Canada, visiting researcher at Hong Kong Polytechnic University, and visiting scholar at Temple University in the United States. The main research directions are: polarization imaging, hyperspectral imaging, image processing, and deep learning. Hosted and participated in more than 20 projects of the National Natural Science Foundation of China, etc., won 5 provincial awards, published 3 multi-band polarized imaging related monographs, published more than 100 papers, and was selected by the Ministry of Education New Century Excellent Talent Program in 2012. IEEE Sensors Journal Editorial Board, Remote Sensing, Journal of Sensors Guest Editors, IEEE TC, TIP, TGRS, OE, etc. reviewer of international and domestic publications.

Speech Title: “Polarization Gradient Histogram for Object Tracking in Infrared Polarization Imaging”

Abstract: Polarization is one of the basic characteristics of radiation. Infrared polarization imaging effectively extends infrared imaging from the acquisition of scalar data to the acquisition of vector data. Infrared polarization imaging not only increases the dimension of the acquired data, but also has unique advantages in anti-jamming target detection and man-made object identification in complex environments. This paper presents histogram of infrared polarization mosaic gradient (HIPMG) for feature extraction in infrared polarization imaging. Infrared polarization feature improves the performance of anti-interference for object detection. Division-of-focal-plane polarization imagers (DPIs) enable real-time object tracking in infrared polarization imaging. Traditional processing conducts demosaicing and then computing polarization parameters for object detection and tracking, which can be time consuming and subject to demosaicing error. The proposed technique uses Polarization and Spatial Correlation Matrixes (PCM and SCM) to obtain spatial and polarization correlation of the object. This paper proposes two Polarization Filter Matrixes (PFM) to obtain spatial-polarization gradient maps (SPGMs). The HIPMG descriptor is built from the intensity and direction of SPGMs. Then we present a polarization-track method using HIPMG for object tracking. Experiment demonstrates the effectiveness of our object tracking method over the state-of-the-art methods.