Outline of Keynote Speech - 2

Computing Approaches for Improving Omnidirectional Image Generation and Capturing

Prof. Chinthaka Premachandra
Department of Electronic Engineering, Shibaura Institute of Technology, Japan
chintaka@shibaura-it.ac.jp

Bio: Chinthaka Premachandra was born in Sri Lanka. He received his B.Sc. and M.Sc. degrees from Mie University, Tsu, Japan in 2006 and 2008 respectively, and his Ph.D degree from the Nagoya University, Nagoya, Japan, in 2011. From 2012 to 2015, Dr. Chinthaka Premachandra was an assistant professor in the Department of Electrical Engineering, Faculty of Engineering, Tokyo University of Science, Tokyo, Japan. From 2016 to 2017, he was an assistant in the Department of Electronic Engineering, School of Engineering, Shibaura Institute of Technology, Tokyo, Japan. In 2018, he was promoted to Associate Professor in the Department of Electronic Engineering, Graduate School of Engineering, Shibaura Institute of Technology. In addition, he is the manager of Image Processing and Robotic Lab at the same department. His research interests are Image Processing and Robotics. Former research includes computer vision, pattern recognition, speed up image processing, and camera based Intelligent Transportation Systems, while latter fields include terrestrial robotic systems, flying robotic systems, and integration of terrestrial robot and flying robot. Dr. Chinthaka Premachandra is author/co-author of more than 120 publications, including books, papers published in journals, magazines and conference proceedings. He received the FIT Best Paper Award and FIT Young Researchers Award from IEICE IPSJ, Japan in 2009 and 2010 respectively. He has served many international conferences and journals as a steering committee member and an editor respectively. Dr. Chinthaka Premachandra is the founding chair of International Conference on Image Processing and Robotics (ICIPRoB).

Abstract: Applications for omnidirectional cameras are increasing, because they allow one-shot capture of panoramic images. In an one-shot captured image, there are two circular images, each simultaneously captured by one of the two fisheye lenses on either side of the camera. Due to the panoramic capturing ability, there are many potential applications for omnidirectional cameras, including, drive recorders, surveillance cameras, marine photography, and aerial photography when mounted on a drone. However, omnidirectional camera images generally have lower resolution than available cameras, leading to difficulty in identifying objects farther from the camera. On the other hand, omnidirectional cameras have a fisheye lens on either side, so when mounting them on robots, drones, or automobiles, they must be mounted so that the fields of view of the fisheye lenses will not be obstructed. This keynote focuses on computing based solutions to above mentioned weaknesses of omnidirectional cameras. They include development of a camera platform that can capture regions where recognition is difficult due to the low resolution issue and generation of panoramic images by two hemispherical cameras independent of installation location to reduce the obstruction in image capturing.