Deep Kinect Signal Filtering and Complexity-based Significant Measure for Activity Recognition

Il Hong Suh

Intelligence and Communications for Robots Laboratory, Hanyang University, Seoul, Korea

E-mail: ihsuh@hanyang.ac.kr

Microsoft Kinect can provide computationally inexpensive acquisition of human skeleton tracking in real time. For researchers who investigate human activity recognition based on skeletal poses, this can be an opportunity to achieve good performance at low cost.

However, the Kinect skeleton tracker often incorrectly captures skeleton poses in the presence of self-occlusion, which produces very unnatural motions such as discontinuous and vibrated motions.

In this talk, by employing deep neural networks to get deeply filtered position and velocity signals of skeleton, and then by applying two deep filtered signals to standard Kalman filter, we will show how much the Kinect skeleton pose detection accuracy can be improved even under self-occlusion .

Then, we will present a human activity recognition system in which features are extracted from subsequence of our deep Kinect skeleton filtered trajectories by our proposed complexity-based significance measure.

And also, deep robotic grasping experiences in our lab will be shared.