

Boosting Visual Object Tracking Using Deep Features

Summary: Generic visual tracking is the problem of estimating the trajectory of a target in a video. It is one of the fundamental problems in computer vision with numerous applications in robotics, road scene understanding, structure-from-motion, visual surveillance, autonomous driving, UAV monitoring and intelligent traffic control. The problem is challenging due to several factors, such as appearance changes, scale variations, deformations and occlusions. One of the driving forces behind the recent advancement in object tracking performance is the use of powerful multi-dimensional discriminative image representations. Initially, hand-crafted visual features were used for image description in visual tracking. Recently, Deep learning has pervaded many areas of computer vision bringing significant performance improvements in many vision applications, such as object classification, detection and tracking. In this talk, I will focus on how to use Deep Features for enabling state-of-the-art results in visual object tracking. State-of-the-art results require an appropriate fusion of multi-level multi-modal Deep Features. By introducing a compact representation of Deep Features, smart fusion, and updating mechanisms, real-time performance is achievable without jeopardizing tracking quality.

Biography: Fahad Khan received the M.Sc. degree in Intelligent Systems Design from Chalmers University of Technology, Sweden and a Ph.D. degree in Computer Vision from Computer Vision Center and Autonomous University of Barcelona, Spain. From 2012 to 2014, he was a post-doctoral fellow at Computer Vision Laboratory, Linköping University, Sweden. From 2014-2018, he was a research fellow at Computer Vision Laboratory, Linköping University, Sweden. He is currently an Associate Professor (Universitetslektor and Docent) at the Computer Vision Laboratory, Linköping University Sweden and Lead Scientist at Inception Institute of Artificial Intelligence UAE. He has achieved top ranks on various challenges (Visual Object Tracking VOT: 1st 2014, 2nd 2015, 1st 2016; VOT-TIR: 1st 2015 and 2016; OpenCV Tracking: 1st 2015; 1st PASCAL VOC Segmentation and Action Recognition tasks 2010). He was an invited speaker at Swedish Symposium on Deep Learning, Stockholm, Sweden 2017. He received the best paper award in the computer vision track in IEEE ICPR 2016. He has published more than 50 reviewed conference papers, journal articles, and book contributions. His research interests include computer vision, object recognition and deep learning for computer vision.