

PhD Funding Opportunity

Universiti Sains Malaysia

Project Title : Adaptive Appearance Models in Video Tracking & Surveillance

Project Commencement : Expected to be June or July 2015

Project Summary A fundamental component in achieving robust target tracking in long-term aerial video surveillance is the tracker's ability to update its internal target representation to changing conditions over time. Several factors such as illumination and pose changes, occlusions, deformable targets, distractors and clutter adversely affect the performance of aerial video trackers. In addition, adaptive appearance modeling requires that the contradicting requirements of rapid on-line learning and stable memory (stability-plasticity dilemma) be fulfilled in order to avoid issues like drifts and risk of making wrong measurements of targets.

The objective of this research is to investigate a hybrid tracker which utilizes a discriminative approach: an online incremental learning method for target tracking using state of art visual descriptors coupled with a generative observation model which uses a maximum-likelihood or maximum-a-posteriori formulation usable for long term tracking of moving targets in video sequences.

Expected outcome is a aerial video tracker which is

1. robust to long-term tracking issues
2. adaptive to changes in target and background appearance
3. be able to deal with real-time processing of at least 15 frames per second.

The significance of this work can be appreciated with the proliferation and importance of real-time surveillance systems for both civilian and military security purposes. It would have impact in applications such as automated surveillance, motion-based recognition, human-computer interaction, vehicle navigation to name a few

Level of Study : PhD

Requirements : The successful candidate must be successfully admitted to study at the School of Computer Sciences, Universiti Sains Malaysia at PhD level. Ideal candidate should have a Master's degree in Computer Science or Computer Engineering with a strong fundamentals in Mathematics and Programming in C++/Python/MATLAB. Knowledge of OpenCV is an added advantage. Local candidates with a BSc. Computer Science (First Class) or CGPA of more than 3.50 can also apply. The grant will offer financial support of up to RM2500 per month (subject to terms and conditions and performance of candidate) for a period of 2-3 years.

Application Details : Submit a full CV and academic transcript together with your contact details to Assoc. Prof. Dr. Dhanesh Ramachandram (dhaneshr@ieee.org) before 15th May 2015.