

FACULTY MENTOR Vasconcelos, Nuno

PROJECT TITLE Fast face/hand detection and tracking for gesture video

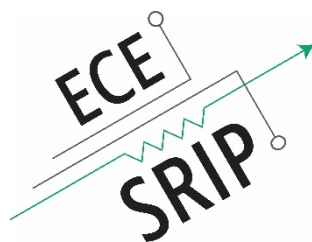
PROJECT DESCRIPTION

SVCL is interested in building a purely vision-based system to understand continuous gesture/sign language videos. One of the key component of the system is an accurate and fast face/hand detector that can detect head and hands of the person. The detection result will be further processed by a tracker to smooth the trajectory and to deal with detection failures. The selected intern will work on the development of the system and improvement of the algorithms.

INTERNS NEEDED 1 MS Student OR 1 Undergrad Student

PREREQUISITES

Candidates are expected to have basic knowledge of Python, Linux and computer vision.



FACULTY MENTOR Vasconcelos, Nuno

PROJECT TITLE Large scale visualization/annotation system for video datasets

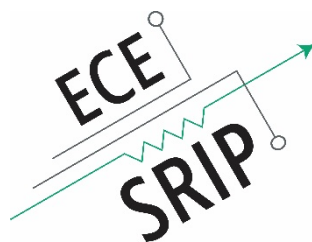
PROJECT DESCRIPTION

Recent advancement in deep learning increases the need for large scale datasets. As one side-effect, the management of datasets has become a non-trivial problem. This is particularly true for large scale video datasets where each video consists of hundreds of frames. At SVCL we're interested in building a web-based visualization/annotation system for video datasets in order to browse and annotate video with rich meta information. For example, users can use this system to search for videos of interest and update both textual and visual annotations (e.g. bounding boxes) for each frame. The selected intern will work on building the system and use it to collect a large scale video dataset by crowdsourcing.

INTERNS NEEDED 1 MS Student OR 1 Undergrad Student

PREREQUISITES

Candidates are expected to have basic knowledge of Python, Linux and computer vision.



FACULTY MENTOR Vasconcelos, Nuno

PROJECT TITLE Light-weight CNN for pose estimation in gesture video

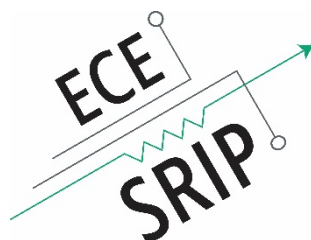
PROJECT DESCRIPTION

SVCL is interested in building a purely vision-based system to understand continuous gesture/sign language videos. To extract the trajectory of human body parts in the video, a pose estimation system is needed. This project will take advantage of recent inventions in deep learning and retrain the CNNs on gesture datasets with a light-weight network to achieve moderate speedup. The selected intern will work on implementation and training of the CNN.

INTERNS NEEDED 1 MS Student OR 1 Undergrad Student

PREREQUISITES

Candidates are expected to have basic knowledge of Python, Linux and computer vision. Familiarity with deep learning/CNN will be a plus.



FACULTY MENTOR Vasconcelos, Nuno

PROJECT TITLE Facial landmark localization with deep learning

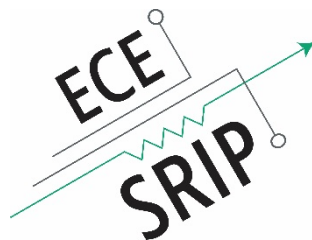
PROJECT DESCRIPTION

Facial landmark localization is critical for face recognition and analysis. The system takes in a face image as input and output the locations of several keypoints such as nose-tip and eye corners of the face. The performance of facial landmark localization has been hugely improved with the recent CNN based methods. This SVCL project aims to test and benchmark several facial landmark localization network and use the output to build applications such as emotion recognition and lip-reading. The selected intern will work on implementation and training of the CNN.

INTERNS NEEDED 1 MS Student OR 1 Undergrad Student

PREREQUISITES

Candidates are expected to have basic knowledge of Python, Linux and computer vision. Familiarity with deep learning/CNN will be a plus.



FACULTY MENTOR Vasconcelos, Nuno

PROJECT TITLE Image collection with drones

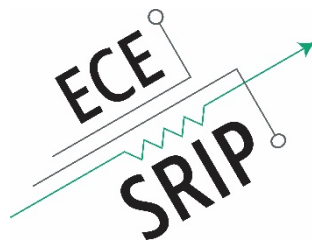
PROJECT DESCRIPTION

The last few years have shown that a critical component in the design of effective image classification systems is the availability of large training datasets. Drones are a new way to collect large numbers of images of objects in a relatively inexpensive manner. At SVCL we are interested in collecting datasets of objects under many views and in collecting datasets of scenes. The selected intern will develop protocols for the use of drones in data collection and apply those protocols to the assembly of a few datasets.

INTERNS NEEDED 1 MS Student OR 1 Undergrad Student

PREREQUISITES

Candidates are expected to have basic knowledge of Python, Linux and computer vision.



FACULTY MENTOR Vasconcelos, Nuno

PROJECT TITLE Real-time object detection on drones

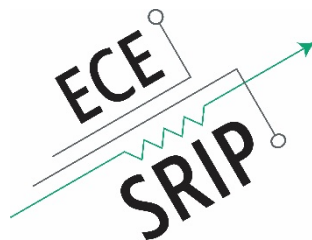
PROJECT DESCRIPTION

SVCL has a long history in the area of object detection and has produced several real-time object detectors. Particular emphasis has been given to the detection of pedestrians, where we have produced some of the best detectors available. We would now want to extend this capability to drones. The project will involve collecting images of people with drones, training real-time object detectors on this data, and implementing the object detectors in the drone.

INTERNS NEEDED 1 MS Student OR 1 Undergrad Student

PREREQUISITES

Candidates are expected to have basic knowledge of Python, Linux and computer vision. Familiarity with deep learning/CNN will be a plus.



FACULTY MENTOR Vasconcelos, Nuno

PROJECT TITLE Biological imaging

PROJECT DESCRIPTION

SVCL has a collaboration with the Scripps Institute of Oceanography to classify Plankton images collected by an underwater microscope. This component of the project addresses the collection of datasets and the training of classifiers for Plankton images. It will use a desktop microscope, built at Scripps, to collect many images of live Plankton specimens. This dataset will then be used to train deep CNNs. If the selected candidate has experience in diving, there will also be opportunities to dive on the Scripps pier and work with the underwater microscopes. This is, however, not a requirement.

INTERNS NEEDED 1 MS Student OR 1 Undergrad Student

PREREQUISITES

Candidates are expected to have basic knowledge of Python, Linux and computer vision. Familiarity with deep learning/CNN will be a plus.

