סמינריון

הנך מוזמן/ת להרצאה סמינריונית של הפקולטה להנדסת מכונות שתתקיים ביום ב' 30.12.2019
(ב' בטבת, תש"פ), בניין דן קאהן, אודיטוריום 1, 14:30.

מרצה: יערה שבו

מנחה: פרופ' ענת פישר

מנחה שותף: גב' רונית שניאור

על הנושא:

Estimating 3D Objects Orientation using Learning Methods on Point Clouds

The seminar will be given in Hebrew

תקציר ההרצאה :

Geometric analysis of scanned 3D objects is an important task for variety of applications. It is highly used to understand a scene and reconstruct 3D objects for robotics or virtual reality and augmented reality applications. It is also important for reconstructing a CAD model from a scanned object.

With increasing computational power and size of image databases, learning methods have managed to achieve good results in common computer vision tasks such as classification and segmentation. After deep learning methods became popular for 2D data, a breakthrough of a few deep learning networks for point cloud data had led to them becoming popular for the analysis of 3D data as well.

This research aims to perform analysis of scanned 3D objects using learning methods and in particular orientation estimation of point clouds. The problem is formulated as obtaining the orientation of an object point cloud in respect to another object point cloud. The analysis process inherently includes acquisition and pre-processing of the data and construction of suitable learning models. Orientation estimation task is challenging as we deal with input of two point clouds where information from two point clouds needs to be combined. This adds up to the challenges of working with point cloud data such as the noisy characteristics of the data and its unordered behavior.

In the proposed method a feature vector representation of the point clouds is obtained and the relative rotation is estimated using a uniquely designed regression network. Derived from that, the method deals with the use of point cloud descriptors and with modeling spatial transformations from feature spaces. This is done while maintaining a simple comprehensible pipeline, which as demonstrated in our results, generalizes well for many categories and can be applied to noisy data.

The proposed method estimates orientation of objects point clouds while using a rather generic pipeline and generic modules which assists in making a robust method that can be straightforwardly adapted to different data domains and different applications, yet produce good orientation estimation results.

בברכה,

פרופ"א מתי סאס

מרכז הסמינרים