Technion-Israel Institute of Technology

Computer Science Department

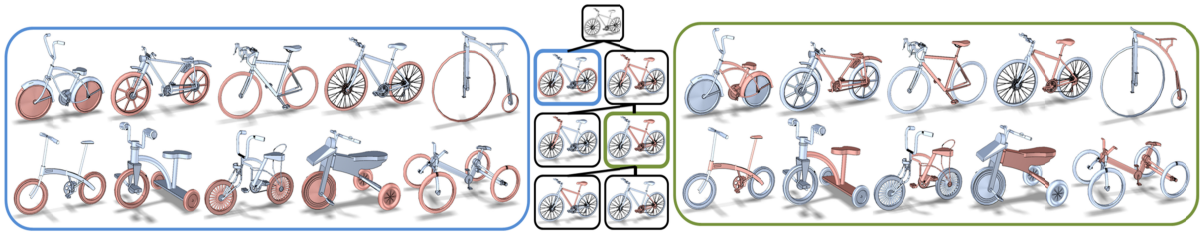
Center for Graphics and Geometric Computing

CGGC Seminar

Dr. Oliver Van Kaick

The Blavatnik School Of Computer Science, Tel Aviv University

Co-segmentations and Structural Co-Hierarchies of Sets of Shapes



I would like to present our work where we address the challenge of computing consistent segmentations of sets of shapes. The sets may exhibit significant variability, with the shapes differing in their geometry and topology, as in the case of man-made shapes. We stipulate that, in this context, a correspondence between shape parts can be established by the incorporation of additional knowledge present in the set itself or provided by user input. Thus, we introduce three approaches for computing consistent segmentations. In the first approach, of a supervised nature, the knowledge is provided by the user as a training set of manually segmented and labeled shapes. The training set is used in conjunction with shape descriptors to learn classifiers that distinguish different semantic classes of parts. The second approach, which is unsupervised, derives the knowledge automatically from the set of shapes. If all the shapes in the set roughly possess the same semantic part composition, we can derive their common structure by analyzing the shapes simultaneously, rather than individually. This co-segmentation is achieved by clustering shape segments in a descriptor space with a spectral method, which makes use of third-party connections between shape parts. In the third approach, we extend the unsupervised co-segmentation to efficiently incorporate direct user input, to arrive at a semi-supervised co-segmentation approach that allows us to obtain consistent segmentations that are close to error-free.

I would also like to introduce our latest work, where we go beyond the identification of low-level part primitives of a shape and obtain a meaningful hierarchical organization of the shape parts. Importantly, the part hierarchy is computed by taking into account an entire set of shapes, so that the resulting co-hierarchy provides a unified explanation of the structural part organization of the shapes across the set.

The lecture will be held on Sunday, 2.6.2013, at 13:00, Taub 337

Snacks and Beverages at 12:45

הזמנה זו מהווה אישור כניסה עם רכב לטכניון