

NATIONAL UNIVERSITY OF SINGAPORE

School of Computing

C S S E M I N A R

Title: Learning 6D Object Pose Estimation Using 3D Object Coordinates

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Chaired by: Dr Brown, Michael Scott, Associate Professor, School of Computing
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Abstract:

This work addresses the problem of estimating the 6D Pose of specific objects from a single RGB-D image. We present a flexible approach that can deal with generic objects, both textured and texture-less. The key new concept is a learned, intermediate representation in form of a dense 3D object coordinate labelling paired with a dense class labelling. We are able to show that for a common dataset with texture-less objects, where template-based techniques are suitable and state of the art, our approach is slightly superior in terms of accuracy. We also demonstrate the benefits of our approach, compared to template-based techniques, in terms of robustness with respect to varying lighting conditions. Towards this end, we contribute a new ground truth dataset with 10k images of 20 objects captured each under three different lighting conditions. We demonstrate that our approach scales well with the number of objects and has capabilities to run fast.

Biodata:

I did my diploma in computer science and media at Technical University Dresden in 2011. Since 2008 I was working with Iva Toli c-Norrelykke's group at the Max Planck Institute of Cell Biology and Genetics in Dresden, where I also did my diploma thesis. I was developing algorithms for pose estimation of yeast cells, and the localization of fluorescent molecules inside of cells.

Since 2012 I am back at TU Dresden as PHD student at Stefan Gumhold's Chair of Computer Graphics and Visualization. Given my background in image analysis however, there was a close collaboration with Carsten's chair and I will join his group next year. In these last two years my work was focused on pose estimation from RGB-D images. I am particularly interested in statistically motivated methods as well as the combination of

generative and discriminative approaches.