

**DEPARTMENT OF MECHANICAL ENGINEERING****SEMINAR****Online**

Title: Real-to-virtual domain transfer-based depth estimation for real-time 3D annotation in transnasal surgery: a study of annotation accuracy and stability

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Date: 27 April, 2021 (Tuesday)

Time: 3:00 p.m.

Zoom Link: 1) Link to join the meeting:

<https://hku.zoom.us/j/95071412596?pwd=ZEpyZDk4MitpQnZlUHpsaHdtT3lvZz09>

2) Meeting ID: 950 7141 2596

3) Password: 276359

Abstract:

Surgical annotation promotes effective communication between medical personnel during surgical procedures. However, existing approaches to 2D annotations are mostly static with respect to a display. In this study, we propose a method to achieve 3D annotations that anchor rigidly and stably to target structures upon camera movement in a transnasal endoscopic surgery setting. This is accomplished through intra-operative endoscope tracking and monocular depth estimation. In total, 2 deep neural networks are involved in monocular depth estimation. The first one is an adversarial network that transfers image style from the real endoscopic view to a synthetic-like view, while the second one is a fully-supervised depth estimation network that is trained in a virtual endoscopic environment prior to the prediction phase. Accuracy and stability evaluations are performed on an anatomically-accurate nasal airway phantom to demonstrate the feasibility and practicality of our proposed method for achieving 3D annotations.

ALL INTERESTED ARE WELCOME

For further information, please contact Dr. K.W. Kwok at 3917 2636.

Research area: Robotics and Control