



**Technion-Israel Institute of Technology**  
**Computer Science Department**  
**Center for Graphics and Geometric Computing**



## **CGGC Seminar**

**Hsueh-Ti Derek Liu**

University of Toronto

### **3D Content Creation Made Fast and Easy**

Creating digital 3D objects has been a central task across different disciplines and the key towards democratizing the metaverse. However, 3D content creation is still a privilege reserved for professional modelers because existing content creation tools are difficult to use by the general public. My research aims to lower the difficulty of 3D content creation to the point where everyone can manipulate digital 3D shapes. In this talk, I will first discuss how to build easy-to-use modeling algorithms using machine learning. Specifically, this involves developing network architectures on triangle meshes, which are robust to shape variants (e.g., different resolution and rigid transformation). We demonstrate how our approach can generalize even when trained on only a single shape. I will then expand the discussion to numerical methods -- multigrid methods on curved surfaces -- that are crucial to support interactive content creation at scale. I believe that future 3D content creation will involve more high-level and "smart" operations. Such operations will require robust geometric learning to harness 3D data in the wild and numerical methods to process geometric data at scale. By solving these challenges, I argue that easy-to-use 3D content creation tools will push the boundaries of fabrication, architecture, and democratize the metaverse.

#### **Bio:**

Hsueh-Ti Derek Liu is a Ph.D. candidate at the University of Toronto studying digital geometry processing. Derek's work mainly focuses on developing easy-to-use 3D modeling tools and scalable numerical methods for processing geometric data. His research is published at top-tier venues (ACM SIGGRAPH and ICLR) and is supported by an Adobe Research Fellowship. His PhD advisor is Prof. Alec Jacobson. He worked as a visiting scholar at École Polytechnique in 2019, working with Prof. Maks Ovsjanikov. He completed his M.S. with Profs. Keenan Crane and Levent Burak Kara at Carnegie Mellon University. (Website - <https://www.dgp.toronto.edu/~hsuehtil/>)

**The lecture will be held on Sunday, 24.07.2022, at 11:00, Taub 337**

**הזמנה זו מהווה אישור כניסה עם רכב לטכניון**