UNIVERSITY of GUELPH

COLLEGE of ENGINEERING AND PHYSICAL SCIENCES

SCHOOL OF COMPUTER SCIENCE

PhD Seminar 1

Monday April 3, 2023 at 1pm via Zoom [Remote]

Yukun Shi

Multi-view Stereo: Current Trends, Challenges, and Recent work

Advisor: Dr. Minglun Gong
Advisory: Dr. Fei Song
Advisory: Dr. David Flatla

Abstract:

Multi-view stereo (MVS) aims to estimate the 3D model from a given set of calibrated images. Due to its wide applications in virtual/augmented reality and 3D printing, much progress has been made in this domain for decades. Over the last few years, researchers have put effort into improving the quality of dense 3D reconstruction and have achieved impressive results.
One of the current trends is the use of non-learning-based methods. It utilizes hand-crafted similarity metrics and regularizations to compute dense correspondences and recover 3D points. Another trend is the integration of MVS with learning-based techniques, which utilizes neural networks for feature learning and multi-scale training. However, with the large-scale data, some common limitations, such as low-textured, specular, and reflective regions of the scene, make dense matching intractable and thus lead to incomplete reconstructions.

This seminar will present a comprehensive review of multi-view stereo solutions, including defining and motivating the MVS problem, describing recent traditional and learning-based methods, benchmarks, evaluation methods, and up-to-date results. Moreover, our recent work on pixelwise view selection will be discussed. Finally, limitations and possible future directions will both be addressed.