Quoc-Minh Ton-That

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Education

École de Technologie Supérieure

Ph.D. Computer Science

◦ Thesis on real-time elastodynamic simulation with cutting for virtual surgery. Co-supervised by professors Sheldon Andrews ℤ and Paul G. Kry ℤ.

École de Technologie Supérieure

B.Eng. Software Engineering

• GPA: 4.0/4.3

Experience

Research Scientist

Symgery

• Engineered a real-time surgical simulation framework including cutting in Unreal Engine.

 $\circ\,$ Improved soft body simulation stability in cut regions via a novel hybrid FEM-SPH coupling method.

R&D Software Developer

Symgery

- \circ Enhanced visual fidelity of topologically changing geometry by extending a real-time GPU accelerated isosurface extraction algorithm.
- $\circ~$ Integrated essential boundary conditions for reduced order FEM models in Unreal Engine.

R&D Software Developer

PreVu3D

- Orchestrated an end-to-end automated surface reconstruction pipeline to transform massive laser scanned point clouds to full-fledged refined 3D polygon meshes without manual intervention.
- Designed a large scale data storage mechanism in the cloud for efficient out-of-core point cloud streaming.

Cloud Software Developer

Genetec

- $\circ\,$ Developed a proof of concept cutting-edge microservices system for the migration of legacy cloud software components.
- $\circ~$ Upgraded legacy cloud system monitoring tools, reducing on-call alerts by 20 %.

Publications

Generalized eXtended Finite Element Method for Deformable Cutting via Boolean Operations	Aug 2024
Quoc-Minh Ton-That, Paul G. Kry, Sheldon Andrews	
https://doi.org/10.1111/cgf.15184	
Parallel Block Neo-Hookean XPBD using Graph Clustering	Nov 2022
<u>Quoc-Minh Ton-That</u> , Paul G. Kry, Sheldon Andrews	
https://doi.org/10.1016/j.cag.2022.10.009	

May 2021 - Present

May 2018 - Apr 2021

June 2021 - Mar 2022

May 2020 - Aug 2020

Apr 2019 - Aug 2019

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Sep 2018 - Apr 2019

Aug 2024

Talks

Multiscale Vertex Block Descent	Nov 2024
The annual Quebec-Ontario pre-SIGGRAPH workshop, organized by and for the major East-Canadian computer graphics labs (GRAPHQUON 2024) at École de technologie supérieure, Quebec, Canada. <u>Best Presentation honourable mention</u>	
Generalized eXtended Finite Element Method for Deformable Cutting via Boolean Operations	Aug 2024
The 23rd ACM SIGGRAPH / Eurographics Symposium on Computer Animation (SCA 2024) at McGill University, Montreal. <u>Best Paper award</u>	
Generalized eXtended Finite Element Method for Deformable Cutting via Boolean Operations	Dec 2023
The annual pre-SIGGRAPH workshop, organized by Central-Canadian computer graphics labs in Quebec and Ontario (GRAPHQUON 2023) at University of Waterloo, Ontario, Canada. Best Presentation	
Parallel Block Neo-Hookean XPBD using Graph Clustering	Nov 2022
The 15th annual ACM/SIGGRAPH conference on Motion, Interaction and Games (MIG 2022) at Universidad de Guanajuato, Mexico. Best Paper honourable mention	
Efficient Hybrid Coupling Method for Interactive Virtual Cutting	Nov 2021
The annual Ontario-Quebec pre-SIGGRAPH workshop, organized by Central-Canadian computer graphics labs (Tomatograph 2021) at University of Toronto, Ontario, Canada.	

Awards

FRQNT Doctoral Scholarship	2024 - 2028
NSERC Canada Graduate Scholarship - Master's program	2023 - 2024
FRQNT Master's Scholarship Fonds de recherche du Outber — 17 500 CAD	2023 - 2024
Mitacs Accelerate Fellowship	2021 - 2022
Academic Excellence Scholarship	2021 - 2023
Loole de Technologie Superieure — 40 000 CAD Undergraduate Honour List	2021
Ecole de Technologie Supérieure Academic Excellence Scholarship	2018
TD Insurance Meloche Monnex — 2 000 CAD	

Teaching

MTI855 Game Physics Graduate course instructor — École de Technologie Supérieure May 2023 - Aug 2023

Referee Service

ACM Special Interest Group on Computer Graphics and Interactive	2025
Techniques (SIGGRAPH)	
Computers & Graphics (C&G)	2025
Computer Graphics Forum (CGF)	2024
ACM Transactions on Graphics (TOG)	2023

Projects

Physics Based Animation Toolkit

 \circ Cross-platform C++ library of algorithms and data structures commonly used in computer graphics research on physically-based simulation with Python bindings.

Skills

Languages: C++, Python, C#

Technologies: CMake, Git, CUDA, Unreal Engine

Methods: Physically based simulation, Geometry processing, Numerical optimization, Matrix computations, Partial differential equations (PDEs), Parallel computing, Graph algorithms, Model reduction, Physics informed machine learning, Software engineering

Hobbies

Football, Weightlifting, Manga, Anime, Animals, Music