Quoc-Minh Ton-That

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Q-Minh

Education

École de Technologie Supérieure *May 2021 - Present*
Ph.D. Computer Science

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

École de Technologie Supérieure *May 2018 - Apr 2021*
B.Eng. Software Engineering

- GPA: 4.0/4.3

Experience

PhD Research Intern *San Mateo, CA, USA*
Roblox Corporation *May 2025 - Sep 2025*

- Extended the company's in-house physics engine into a unified multi-physics solver framework, enabling support for coupled dynamics and scalability to new phenomena.
- Designed and implemented a cloth model tailored to the platform's highly-specialized computational environment.
- Investigated methods to accelerate cloth simulation for real-time applications, balancing numerical accuracy with strict runtime performance requirements.

Research Scientist *Montreal, QC, Canada*
Symgery *June 2021 - Mar 2022*

- Engineered a real-time surgical simulation framework including cutting in Unreal Engine.
- Improved soft body simulation stability in cut regions via a novel hybrid FEM-SPH coupling method.

R&D Software Developer *Montreal, QC, Canada*
Symgery *May 2020 - Aug 2020*

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

R&D Software Developer *Montreal, QC, Canada*
PreVu3D *Apr 2019 - Aug 2019*

- 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 *Montreal, QC, Canada*
Genetec *Sep 2018 - Apr 2019*

- Developed a proof of concept cutting-edge microservices system for the migration of legacy cloud software components.
- 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

Quoc-Minh Ton-That, Paul G. Kry, Sheldon Andrews

https://doi.org/10.1016/j.cag.2022.10.009

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. **Best Presentation honourable mention**

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. **Best Paper award**

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
Fonds de recherche du Québec — 100 000 CAD

NSERC Canada Graduate Scholarship - Master's program 2023 - 2024
Natural Sciences and Engineering Research Council of Canada — 17 500 CAD

FRQNT Master's Scholarship 2023 - 2024
Fonds de recherche du Québec — 17 500 CAD

Mitacs Accelerate Fellowship 2021 - 2022
Mitacs — 30 000 CAD

Academic Excellence Scholarship 2021 - 2023
École de Technologie Supérieure — 40 000 CAD

Undergraduate Honour List 2021
École de Technologie Supérieure

Academic Excellence Scholarship 2018
TD Insurance Meloche Monnex — 2 000 CAD

Teaching

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

Referee Service

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

Projects

Physics Based Animation Toolkit *github*

- 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