Michael Xu

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Education

- **MSc in Computing Science**, *Simon Fraser University* May 2023 — Present
  - Advisor: Xue Bin Peng
- **BASc in Engineering Science**, *University of Toronto* Sep 2015 — Apr 2020
  - Electrical and Computer Engineering option
  - Undergraduate Thesis Advisor: David I. W. Levin

Publications

- **Michael Xu**, Yi Shi, KangKang Yin, Xue Bin Peng. PARC: Physics-based Augmentation with Reinforcement Learning for Character Controllers. *In ACM SIGGRAPH 2025 Conference Proceedings (SIGGRAPH '25)* (2025).
- **Michael Xu***, Changyong Song*, David I. W. Levin, David Hyde. A Differentiable Material Point Method Framework for Shape Morphing. *IEEE Transactions on Visualization and Computer Graphics* (2025).

(denotes equal contribution)*

Work Experience

- **Research Intern**, *Disney Research Studios* Jun 2025 — Aug 2025
  - Advanced an internal collaborative character animation research project through the design and implementation of generative modeling techniques
  - Supervisors: Jakob Buhmann and Martin Guay
- **Simulation Software Developer**, *Rocscience Inc.* May 2020 — Jan 2023
  - Implemented a C++ rigid body simulation engine for a rockfall simulation software: RocFall3
  - Implemented a C++ material point method engine for an internal research project
- **Software Developer Intern**, *Rocscience Inc.* May 2019 — Aug 2019
- **Software Engineering Intern**, *Microsemi Corporation* Jul 2018 — Apr 2019
- **Summer Research Student**, *UofT Dynamic Graphics Project* May 2017 — Aug 2017
- **Technical Student**, *Toronto Hydro* May 2016 — Aug 2016

Invited Talks

- **Physics-based Augmentation with Reinforcement Learning** Aug 7, 2025
  ETH Zürich — Computational Robotics Lab
  Zürich, Switzerland
- **Physics-based Augmentation with Reinforcement Learning** Jul 15, 2025
  Disney Research Studios — Robotics Group
  Zürich, Switzerland
- **Physics-based Augmentation with Reinforcement Learning** Jul 1, 2025
  Disney Research Studios — Animation Group
  Zürich, Switzerland

Posters

- **Michael Xu***, Changyong Song*, David I. W. Levin, David Hyde. A Differentiable Material Point Method Framework for Shape Morphing. *Symposium of Computer Animation*, (2024)
  Best Poster Award
- **Michael Xu**, David I. W. Levin. Deformation Gradient Control of Physically Simulated Elastoplastic Amorphous Objects. *Symposium of Computer Animation*, (2023)

(denotes equal contribution)*

Software

- **Motion Forge** – github.com/mshoe/PARC
  - A motion and terrain editing software, which also supports interactive and controllable generation of motions using models trained via PARC
  - The repo also includes the PARC training code
- **DiffMPMAnimator3D** – github.com/mshoe/DiffMPMAnimator3D
  - A software for producing 3D morphing animations of physically simulated elastoplastic amorphous objects via differentiable MPM simulation
- **MPM Buddy** – github.com/mshoe/MPM_Buddy
  - A 2D material point method simulator, with a collection of visualization and interaction tools
- **Voxel Engine** – github.com/mshoe/GPU_Voxel_Raytracer
  - An isometric terrain viewer with editable voxels and procedural generation

Awards

- Best Poster Award - Symposium of Computer Animation 2024 — 2024
- 3rd at Ontario Engineering Competition - Programming — 2018
- 1st at UofT Engineering Kompetition (UTEK) - Programming — 2018
- 2nd at WearHacks Toronto Hackathon — 2016
- 3rd at UofT Game-Making Deathmatch — 2016
- Vale Higher Education Scholarship — 2015
- UofT President's Entrance Scholarship — 2015

Community Involvement

- Choir Member, *SFU Choir (Simon Fraser University Student Choir)* — 2023
- Choir Member, *Resonance (Mississauga Festival Choir)* — 2022 — 2023
- Volunteer Musician, *Healing Sounds of Music (performed at retirement homes)* — 2020 — 2023
- Choir Member, *Healing Sounds of Music Choir (University of Toronto Student Choir)* — 2020
- Co-founding Member, *UTMIST (University of Toronto Machine Intelligence Student)* — 2017 — 2018
- Member, *utGDDC (University of Toronto Game Design & Development Club)* — 2016 — 2017
- Member, *UTAT (University of Toronto Aerospace Team)* — 2016
- Lead Guitarist, *Jazz Lab (Cawthra Park Secondary School Senior Jazz Ensemble)* — 2014 — 2015
- Guitarist, *Cawthra Park Secondary School Guitar Ensemble* — 2011 — 2015
- Choir Member, *The Ritz (Cawthra Park Secondary School Choir)* — 2011 — 2015