

# Michael Xu

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## Education

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- **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

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- **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

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- **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
- **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

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- **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

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- **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

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- **Motion Forge** – [github.com/mshoe/PARC](https://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](https://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](https://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](https://github.com/mshoe/GPU_Voxel_Raytracer)
  - An isometric terrain viewer with editable voxels and procedural generation

## Awards

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| • 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

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