Yifei Li

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RESEARCH INTERESTS

Computer Graphics, (Differentiable) Physical Simulation, Computational Design, Machine Learning

EDUCATION

- **Massachusetts Institute of Technology**   Cambridge, MA
  Ph.D. in Electrical Engineering & Computer Science; GPA: 5.0/5.0   *Sep 2020 – Present*
  M.S. in Electrical Engineering & Computer Science; GPA: 5.0/5.0   *Sep 2020 – May 2022*

- **Carnegie Mellon University**   Pittsburgh, PA
  B.S. in Computer Science; Minor in Machine Learning; GPA: 3.86/4.0   *Sep 2016 – May 2020*

SELECTED PUBLICATIONS

- **DiffAvatar: Simulation-Ready Garment Optimization with Differentiable Simulation**
  Yifei Li, Hsiao-yu Chen, Egor Larionov, Nikolaos Sarafianos, Wojciech Matusik, Tuur Stuyck
  IEEE / CVF Computer Vision and Pattern Recognition (CVPR), 2024

- **Fluidic Topology Optimization with an Anisotropic Mixture Model**
  Yifei Li, Tao Du, Sangeetha Grama Srinivasan, Kui Wu, Bo Zhu, Eftychios Sifakis, Wojciech Matusik
  ACM Transactions on Graphics (SIGGRAPH Asia 2022, Journal Track)

- **DiffCloth: Differentiable Cloth Simulation with Dry Frictional Contacts**
  Yifei Li, Tao Du, Kui Wu, Jie Xu, Wojciech Matusik
  ACM Transactions on Graphics (SIGGRAPH 2022)

- **Dynamic Fluidic Design with Differentiable Navier-Stokes Simulation**
  Yifei Li, Yuchen Sun, Pingchuan Ma, Eftychios Sifakis, Tao Du, Bo Zhu, Wojciech Matusik
  In Submission

- **Algorithmic Quilting Pattern Generation for Pieced Quilts**
  Yifei Li, David E. Breen, Jim McCann, Jessica Hodgins
  Graphics Interface, 2019

- **A Method for Automatically Animating Children's Drawings of the Human Figure**
  Harrison Jesse Smith, Qingyuan Zheng, Yifei Li, Somya Jain, Jessica Hodgins
  ACM Transactions on Graphics (presented at SIGGRAPH 2023)

- **JoinABLe: Learning Bottom-up Assembly of Parametric CAD Joints**
  Karl D.D. Willis, P. K. Jayaraman, H. Chu, Y. Tian, Yifei Li, D. Grandi,
  A. Sanghi, L. Tran, J. G. Lambourne, A. Solar-Lezama, W. Matusik
  IEEE / CVF Computer Vision and Pattern Recognition (CVPR), 2022

ACADEMIC RESEARCH EXPERIENCE

- **MIT CSAIL, PhD student**   Cambridge, MA
  Advised by Prof. Wojciech Matusik (Computational Design & Fabrication Group)   *Sep 2020 - Present*
- **CMU Graphics Group, Undergraduate Research Assistant**   Pittsburgh, PA
  Advised by Prof. Jessica Hodgins   *May 2017 - May 2020*

INDUSTRY EXPERIENCE

- **Meta Reality Labs, Research Scientist Intern**   Sausalito, CA
  Advised by Tuur Stuyck   *May – Sep 2023*
  - **DiffAvatar** : Research project on physics-based digital avatar garment shape, material and body shape joint optimization using differentiable simulation. Resulted in a paper accepted to CVPR 2024.

- **NVIDIA, Research Intern**   Cambridge, MA
  Advised by Miles Macklin, Jonathan Leaf (Simulation Technology Group)   *May – Aug 2022*
  - **Neural cloth simulation**: Research on learned cloth dynamics with collision handling through self-supervised learning

- **Facebook AI Research, Research Intern** Pittsburgh, PA
  Advised by Jessica Hodgins *May – Aug 2020*
  - **Automatic Rigging and Animation of Highly Varied Hand-Drawn Humanoids**: The project resulted in a publication in ACM Transactions on Graphics, a public demo (https://sketch.metademolab.com/canvas) with millions of users, which in turn resulted in an annotated dataset of 180,000 children drawings.

- **Google, Software Engineering Intern** Mountain View, CA
  Manager: Carlos Correa (GeoAR Team) *May – Aug 2019*
  - **AR Content development**: Designed and implemented realistic lighting model estimation for rendering realistic geo-located AR objects for outdoor AR navigation.

- **Activision Blizzard, Software Engineering Intern** Portland, ME
  Managers: Michael Vance, Wade Brainerd (Central Technology Team) *May – Aug 2018*
  - **Call of Duty: Black Ops 4 Game Engine Development**: Implemented a procedural grass system on CPU and GPU from scratch in the core game engine and optimized the system to run at 7ms per frame. Shipped across all platforms in Oct 2018.

AWARDS

- **MIT Stata Family Presidential Fellowship** *2020*
- **CRA Outstanding Undergraduate Researcher Award Honorable Mention** *2020*
- **Carnegie Scholarship, Carnegie Mellon University** *2016-2020*

ACADEMIC SERVICE

- **Peer Review**: ACM SIGGRAPH, ACM SIGGRAPH Asia, CVPR, ECCV, ICCV, Computer Graphics Forum
- **Teaching Assistant**: CMU 15-462/662 Computer Graphics Fall 2017, CMU 15-462/662 Computer Graphics Spring 2018, MIT 6.4420 Computational Design and Fabrication Spring 2024
- **Mentoring**: MIT Undergraduate Research Opportunities Program, High School Outreach
- **Membership**: IEEE, ACM SIGGRAPH, WiGRAPH (Women in Computer Graphics Research), Association for Computing Machinery