HENRIQUE TELES MAIA

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EDUCATION

COLUMBIA UNIVERSITY – Graduate Studies (New York, NY)

Doctor of Philosophy, Computer Science (*exp.*) May 2022
Advisors: Eitan Grinspun & Changxi Zheng
Thesis: *Harnessing Simulated Data with Graphs*
NSF Graduate Research Fellow • GEM Consortium Research Fellow

Master of Philosophy, Computer Science (4.00) Sept 2021
Master of Science, Computer Science (4.17) May 2017

COLUMBIA UNIVERSITY – Dual Bachelor's Program (New York, NY)

Bachelor of Arts, Computer Science May 2015
Bachelor of Science, Mechanical Engineering May 2015

SELECTED RESEARCH EXPERIENCE

Columbia Computer Graphics Group (New York, NY) Jan 2018 – Present
PhD Candidate advised by Eitan Grinspun & Changxi Zheng

- Researching applications of Graph Neural Networks for efficient data-driven physics-based simulation
- Investigated projects related to efficient hair simulation, invisible tagging, 3D printing, granular media, side-channel security, and robotic next-best-view planning for shape understanding
- Mentored numerous students and volunteered extensively towards department community efforts

University of Tokyo (Kashiwa, Japan) Sept 2017 – Dec 2017
Visiting Scholar hosted by Yonghao Yue

- Integrated neural networks into a Material Point Method for enhanced fluid treatment of grains
- Extended APIC constitutive laws to enable fast advection based on learned discrete simulations

Disney Animation Studios (Los Angeles, CA) May 2017 – Sept 2017
Research Intern working with Rasmus Tamstorf

- Explored filtering approaches for redundant constraints in large contact systems to reduce simulation time
- Integrated open-source constraint optimizers and prepared production hair simulation codebase for release

University of Texas at Austin (Austin, TX) Sept 2015 – Mar 2016
Visiting Scholar hosted by Etienne Vouga

- Researched a tunneling-free contact resolution method for discrete elastic rods
- Developed a kinematic data structure to amortize resolving 3D inversions across timesteps

Adobe Systems Inc. (Seattle, WA) June 2015 – Sept 2015
Creative Technologies Lab Intern working with Danny Kaufman

- Explored contact simulation alternatives, optimizing for efficient large-scale n-body problems
- Discovered bottlenecks as well as physical simulation inaccuracies in state-of-the-art codebases

SELECTED PUBLICATIONS

Henrique Teles Maia, Chang Xiao, Dingzeyu Li, Eitan Grinspun, Changxi Zheng
Can one hear the shape of a neural network?: Snooping the GPU via Magnetic Side Channel
USENIX Security 2022 – henrique.is/snooping

Henrique Teles, Maia, Dingzeyu Li, Yuan Yang, Changxi Zheng
LayerCode: Optical Barcodes for 3D Printed Shapes
ACM SIGGRAPH 2019 – henrique.is/tagging

Yun (Raymond) Fei, **Henrique Teles Maia,** Christopher Batty, Changxi Zheng, Eitan Grinspun
A Multi-Scale Model for Simulating Liquid-Hair Interactions
ACM SIGGRAPH 2017 – henrique.is/hairy

SKILLS

RESEARCH: Physics-based Simulation, Machine Learning, 3D Printing, Security, Graphics, GPUs, Tagging

LANGUAGES/OS: C++, Python, MATLAB, C, Java, CUDA, OpenGL, LaTeX, Linux, Mac, Windows

FRAMEWORKS: Tensorflow, PyTorch, Fusion 360, Unity3D, Modo, PTC Creo, Git, OpenCV

COMMUNICATION: English (fluent) • Portuguese (fluent) • French (basic) • Spanish (basic)