

Peter Yichen Chen

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EDUCATION	Columbia University Ph.D. Candidate, Computer Science • Advisor: Eitan Grinspun M.S., Computer Science • GPA: 3.98 2016 - Present
	University of California, Los Angeles B.S., Applied Mathematics, <i>Summa Cum Laude</i> • Advisor: Joseph Teran • 🏆 Sherwood Prize in Mathematics for Outstanding Undergraduate Achievement 2012 - 2016
INDUSTRY EXPERIENCES	Facebook Reality Labs Research Intern • Manager: Kevin Carlberg • Topic: machine learning-based physics simulation Summer - Fall 2020
	Weta Digital Simulation Intern • Manager: Ken Museth • Topic: multiscale skin simulation Summer 2018
PAPER UNDER REVIEW	Peter Yichen Chen , Maytee Chantharayukhonthorn, Yonghao Yue, Eitan Grinspun, and Ken Kamrin. Hybrid discrete-continuum modeling of shear localization in granular media. <i>Journal of the Mechanics and Physics of Solids</i>
PUBLICATIONS	Jonathan David Blutinger, Yorán Meijers, Peter Yichen Chen , Changxi Zheng, Eitan Grinspun, and Hod Lipson. Characterization of co2 laser browning of dough. <i>Innovative Food Science & Emerging Technologies</i> , 52:145–157, 2019 Peter Yichen Chen , Jonathan David Blutinger, Yorán Meijers, Changxi Zheng, Eitan Grinspun, and Hod Lipson. Visual modeling of laser-induced dough browning. <i>Journal of food engineering</i> , 243: 9–21, 2019 Yonghao Yue*, Breannan Smith*, Peter Yichen Chen *, Maytee Chantharayukhonthorn*, Ken Kamrin, and Eitan Grinspun. Hybrid grains: adaptive coupling of discrete and continuum simulations of granular media. <i>ACM Transactions on Graphics (TOG)</i> , 37(6):283, 2019 *Co-first authors: authors contributed equally Jonathan David Blutinger, Yorán Meijers, Peter Yichen Chen , Changxi Zheng, Eitan Grinspun, and Hod Lipson. Characterization of dough baked via blue laser. <i>Journal of food engineering</i> , 232: 56–64, 2018
RESEARCH EXPERIENCES	Hybrid Discrete-Continuum Modeling of Granular Media • Developed a large-scale simulation framework for granular material that combines the speed of the continuum method with the grain-scale accuracy of the discrete method. • Accomplished the accuracy of a pure discrete treatment with 10-100 times speedup under a variety of scenarios. 2016 - Present
	Visual Modeling of Laser Baking • Proposed a data-driven model that predictively generates photorealistic images of laser baked dough from physical experiment parameters. • Achieved image prediction by nonlinearly interpolating and extrapolating high-dimensional training data through a supervised deep generative network. 2017 - 2019
	Ephemeral Affine Particle-In-Cell Method (EAPIC) for Fluid Simulation Summer 2015

- Replaced the widely used Semi-Lagrangian integration scheme with an Affine Particle-In-Cell fashion advection.
- Reduced numerical dissipation in the advection step and better conserved vorticity.

Training Humanoid to Jump using Neural Evolution Spring 2015

- Trained a virtual humanoid character to jump and land through an artificial neural network.
- Evolved the artificial neural network's structure and weights using Evolving Neural Networks through Augmenting Topologies (NEAT).

INVITED TALKS June 2019
 DreamWorks Animation
Hybrid Grains: Adaptive Coupling of Discrete and Continuum Simulations of Granular Media

CONFERENCE PRESENTATIONS June 2019
 Engineering Mechanics Institute Conference 2019
Simulating Shear Localization Using a Hybrid Discrete-Continuum Approach

POSTER PRESENTATIONS October 2019
 The 10th New England Workshop on the Mechanics of Materials and Structures
Simulating Granular Shear Localization Using a Hybrid Discrete-Continuum Approach
October 2017
 The 8th New England Workshop on the Mechanics of Materials and Structures
Simulating Funnel Discharge of Granular Materials Using a Hybrid MPM-DEM Approach

HONORS AND AWARDS
 Best Poster Award, 8th New England Workshop on the Mechanics of Materials and Structures, 2017
 College and Departmental Honors, UCLA, 2016
 Jeffrey George Wilson Research Award, UCLA, 2015
 Irving and Jean Stone Research Award, UCLA, 2015
 Meritorious Winner in Mathematical Contest in Modeling (MCM), COMAP, 2015
 Caltech SURF Fellowship, California Institute of Technology, 2014
 The Rose Gilbert in Memory of Maggie Gilbert Scholarship, UCLA, 2014
 Honorable Mention in Mathematical Contest in Modeling (MCM), COMAP, 2014

TEACHING EXPERIENCES
 Teaching assistant for Computer Graphics (COMS W4160), Physics-based Computer Animation (COMS 4167) at Columbia University

- Held weekly office hours and lectured on the graphics pipeline, rigid body kinematics, linear elasticity, and incompressible viscous fluid.

PROFESSIONAL SERVICES
 Reviewer for SIGGRAPH Asia, Journal of Food Engineering

PROGRAMMING SKILLS
 Language: C/C++, Python, MATLAB, Mathematica
 Library: PyTorch, LibTorch, Ziran, SCISim, PhysBAM, libigl, CGAL, OpenVDB
 Simulation Framework: MPM, FLIP, PIC, DEM, FEM
 Machine Learning: ConvNet, GenerativeNet, Autoencoder
 Parallelization: TBB, OpenMP