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Stephanie Wang

About

My research interests are in geometry processing and physics simulations. I love exploring mathematical solutions that improve existing algorithms and pipelines in computer graphics.

Geometric optimization: Many geometry processing tasks boil down to optimization problems, many of which are nonconvex. New mathematical insights can help discover the convex equivalent problems which comply with the fast and robust convex solvers.

Physics modeling: Physical phenomena like solids, fluids, friction, fracture are crucial in building a virtual world. Existing algorithms often have to choose between performance and accuracy. Mathematical theories can inspire novel discretization schemes that are both faster and better at conserving important physical quantities.

Training

Postdoc, *UC San Diego*.   **2020-present**
Collaborated with and mentored by Ravi Ramamoorthi, Tzu-Mao Li, and Albert Chern (host)

Ph.D. and M.S. in Mathematics, *UCLA*, Eugene V. Cota-Robles Fellow.   **2014-2020**
Committee: Jeffrey D. Eldredge, Wotao Yin, Luminita Aura Vese, and Joseph M. Teran (advisor)

B.S. in Mathematics, *National Taiwan University*, *magna cum laude*.   **2009-2013**

Appointments

Assistant Adjunct Professor, *UCLA Math Dept*, Los Angeles, CA (virtual).   **2020**
Taught remote classes for upper and lower division undergratuate courses: Machine Learning (Math156) and Calculus of Several Variables (Math32A).

Graduate Student Instructor, *UCLA Math Dept*, Los Angeles, CA.   **2019 spring**
Taught course: Linear Algebra and Applications (Math33A).

Teaching Assistant, *UCLA Math Dept*, Los Angeles, CA.   **2015-2020**
Led discussion sessions and graded homework/exams for 11 undergraduate and graduate level courses: linear algebra and introduction to mathematical proofs (Math 115A), undergrad- and grad-level numerical methods (Math 151B, 269A), introductory, intermediate, and advanced C++ programming (PIC 10A, 10B, 10C).

Exchange Scholar and Lab Consultant, *EPFL*, Lausanne, Switzerland.   **2019 summer**
Simulations and data analysis of snow and tire interaction, avalanche release, and snow micro-structure.

Tech Intern, *Walt Disney Animation Studio*, Burbank, CA.   **2018 summer**
R&D for pioneering simulation technology in animated feature films, teaming with VFX artists and developing in C++ and HDK.

Awards

Rising Stars in Computer Graphics Research, *WiGRAPH*.   **May 2022**

Best Paper Award, *ACM SIGGRAPH/Eurographics Symposium on Computer Animation*.   **Jul 2019**

Eugene V. Cota-Robles Fellowship, *UCLA*.   **Sep 2014**

Dean's Award, College of Science, *National Taiwan University*.   **Jun 2013**

Bronze Medal in Applied and Computational Mathematics, *S.T. Yau College Student Mathematics Contest*.   **Aug 2012**

Publications

Mohammad Sina Nabizadeh, Stephanie Wang, Ravi Ramamoorthi, and Albert Chern. Covector fluids. *ACM Trans. Graph.*, 41(4), July 2022

David Palmer, Dmitriy Smirnov, Stephanie Wang, Albert Chern, and Justin Solomon. DeepCurrents: Learning implicit representations of shapes with boundaries. *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, 2022

Jane Carlen, Jaume de Dios Pont, Cassidy Mentus, Shyr-Shea Chang, Stephanie Wang, and Mason A Porter. Role detection in bicycle-sharing networks using multilayer stochastic block models. *Network Science*, 10(1):46–81, 2022

Lars Blatny, Henning Löwe, Stephanie Wang, and Johan Gaume. Computational micromechanics of porous brittle solids. *Computers and Geotechnics*, 140:104284, 2021

Stephanie Wang and Albert Chern. Computing minimal surfaces with differential forms. *ACM Trans. Graph.*, 40(4), July 2021

Mengyuan Ding, Xuchen Han, Stephanie Wang, Theodore F. Gast, and Joseph M. Teran. A thermomechanical material point method for baking and cooking. *ACM Trans. Graph.*, 38(6), November 2019

Xuchen Han, Theodore F. Gast, Qi Guo, Stephanie Wang, Chenfanfu Jiang, and Joseph Teran. A hybrid material point method for frictional contact with diverse materials. *Proc. ACM Comput. Graph. Interact. Tech.*, 2(2), July 2019

Stephanie Wang, Mengyuan Ding, Theodore F. Gast, Leyi Zhu, Steven Gagniere, Chenfanfu Jiang, and Joseph M. Teran. Simulation and visualization of ductile fracture with the material point method. *Proc. ACM Comput. Graph. Interact. Tech.*, 2(2), July 2019

Activities

Research Project Mentor, *Summer Geometry Institute*.   **2021**
Designed a research project and advised undergraduate fellows on minimal surfaces using both Lagrangian and Eulerian representations.

Math Dept Representative, *Graduate Student Association, UCLA*.   **2017-2020**
Advocated for student rights in campus-level organizations and organized cross-department social events.

Volunteer, *AWiSE STEM Day, Explore Your Universe*.   **2015-2020**
Presented interactive math booth in annual science fair designated for middle school girls and general public.

Chief Organizer, *Women in Math, UCLA*.   **2016-2018**
Organized social and volunteering events, represented and advocated for women in math dept.

Creator, *Women in Math Mentorship Program, UCLA*.   **2017**
Negotiated for fundings and created the program that hosts regular mixers for undergraduate and graduate fellows to increase connection, awareness, and mentorship.

Fellow Mentor, *California Teach, UCLA*.   **2016-2018**
Mentored and advised Math and Statistics undergraduate students from underrepresented demographics.

Vice President, *Lambda Club, National Taiwan University*.   **2012-2013**
Organized academic and social events and grew the community from 3 people to 30+ during my service.

References

Prof. Albert Chern (postdoc host and co-author)

Prof. Tzu-Mao Li (co-author)

Prof. Rahul Narain (invited me to serve as SIGGRAPH technical paper reviewer)

Prof. Ravi Ramamoorthi (co-author)

Prof. Justin Solomon (co-author and invited me to serve at MIT Summer Geometry Institute)

Prof. James Tompkin (invited me to serve as SIGGRAPH poster juror)

(Please contact me if more references is required.)

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