

Alexey Stomakhin

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Education

University of California, Los Angeles

M.A. Mathematics (Mar 2011), Ph.D. Mathematics (Jun 2013)

Los Angeles, CA
Aug 2009 – Jun 2013

Area of Specialization: Applied and Computational Mathematics

Moscow Institute of Physics and Technology

B.S. Applied Mathematics and Physics (Jun 2009)

Moscow, Russia
Sep 2005 – Jun 2009

Graduated with Honors, 4.0 GPA

Minor: Computer Science and Electrical Engineering

Summary

Solid background in applied and computational mathematics, including research and coursework in ODEs and PDEs, numerical analysis, scientific computing, numerical linear algebra, computational solid and fluid mechanics, multigrid methods and optimization.

Fluent in C++, but also familiar with a wide range of other programming languages, packages, and paradigms; including C, Java, Pascal, Python, Shell, Perl, \LaTeX , Matlab/Octave and Maple.

Proficient in parallel and high performance computing.

Experience with Houdini and Maya API.

Strong debugging skills.

Experience

Walt Disney Animation Studios

Senior Software Engineer

Burbank, CA
Jul 2013 – present

Development of tools for visual effects simulation.

Walt Disney Animation Studios

Software Engineer

Burbank, CA
Feb 2013 – May 2013

Integration of a material point method (MPM) snow solver (a.k.a. Matterhorn) into production pipeline to be used for deep snow effects in Disney's movie Frozen (2013).

Walt Disney Animation Studios

Graduate Research Intern

Burbank, CA
Jun 2012 – Sep 2012

Optimization of a Maya plugin for physically based character skinning via efficient stencil computation and parallelization/vectorization on a CPU.

Walt Disney Animation Studios

Graduate Research Intern

Burbank, CA
Jul 2011 – Sep 2011

Implementation and performance comparison of multigrid solvers for physically based character skinning.

Intel Corporation
Undergraduate Intern

Moscow, Russia
Apr 2008 – Jul 2009

Development and implementation of automatic verification and graphical representation systems for a processor performance model.

Research

University of California, Los Angeles
Research Fellow

Los Angeles, CA
Jun 2010 – Jun 2013

Crime Modeling, Social Networks, Reconstruction of Missing Data (2010-2011)

Scientific Computing, Solid/Fluid Dynamics, Physically Based Animation, Computer Graphics (2011-present)

My research focuses on realistic simulation of fluids and elastic solids for special effects. My research interests include computational solid and fluid mechanics, solid/fluid coupling, multigrid methods and parallel computing.

Publications

Fluxed Animated Boundary Method. A. Stomakhin, A. Selle. ACM SIGGRAPH 2017.

Moana: Crashing Waves. D.J. Byun, A. Stomakhin. ACM SIGGRAPH 2017 (Talks).

Moana: Performing Water. B. Frost, A. Stomakhin, H. Narita. ACM SIGGRAPH 2017 (Talks).

Rigging the Oceans of Disney's "Moana". J. Garcia, S. Palmer, S. Drakeley, D. Hutchins, E. Ramos, R. Habel, A. Stomakhin. SIGGRAPH Asia 2016 (Technical briefs).

The Material Point Method for Simulating Continuum Materials. C. Jiang, C. Schroeder, J. Teran, A. Stomakhin, A. Selle. ACM SIGGRAPH 2016 (Courses).

Flesh, Flab, and Fascia Simulation on Zootopia. A. Milne, M. McLaughlin, R. Tamstorf, A. Stomakhin, N. Burkard, M. Counsell, J. Canal, D. Komorowski, E. Goldberg. ACM SIGGRAPH 2016 (Talks).

The Affine Particle-In-Cell Method. C. Jiang, C. Schroeder, A. Selle, J. Teran, A. Stomakhin. ACM SIGGRAPH 2015.

"Big Hero 6": Into the Portal. D. Hutchins, O. Riley, J. Erickson, A. Stomakhin, R. Habel, M. Kaschalk. ACM SIGGRAPH 2015 (Talks).

Material Point Method for Viscoelastic Fluids, Foams and Sponges. D. Ram, T. Gast, C. Jiang, C. Schroeder, A. Stomakhin, J. Teran, P. Kavehpour. Eurographics Symposium on Computer Animation (SCA) 2015.

Optimization Integrator for Large Time Steps. T. Gast, C. Schroeder, A. Stomakhin, C. Jiang, J. Teran. IEEE TVCG 2015.

Augmented MPM for Phase-Change and Varied Materials. A. Stomakhin, C. Schroeder, C. Jiang, L. Chai, J. Teran, A. Selle. ACM SIGGRAPH 2014.

A Second Order Virtual Node Algorithm for Navier-Stokes Flow Problems with Interfacial Forces and Discontinuous Material Properties. C. Schroeder, A. Stomakhin, R. Howes, J. Teran. Journal of Computational Physics 2014.

A Material Point Method for Snow Simulation. A. Stomakhin, C. Schroeder, L. Chai, J. Teran, A. Selle. ACM SIGGRAPH 2013.

Energetically Consistent Invertible Elasticity. A. Stomakhin, R. Howes, C. Schroeder, J. Teran. Eurographics Symposium on Computer Animation (SCA) 2012.

Reconstruction of Missing Data in Social Networks Based on Temporal Patterns of Interactions. A. Stomakhin, M. Short, and A. Bertozzi. Inverse Problems 2011.

Patents

Material point method for simulation of granular materials (20150187116)

Augmented material point method for simulating phase change and varied materials (20150186565)

Adaptive material point method (20160210384)

Particle-in-cell methods preserving shearing and rotation (20170185701)

Geometric multigrid on incomplete linear octrees for simulating deformable animated characters (20160292902)

Awards

Horn-Moez prize for excellence in first year graduate studies, UCLA, 2010.

“Best of Disney” technology award for developing a fluid simulation system, The Walt Disney Company, 2016.

Teaching

[University of California, Los Angeles](#)

Teaching Fellow

Los Angeles, CA

Jan 2010 – Jun 2011

Leading discussion sections to review lecture material, tutoring at the Student Math Center, preparing review sessions before exams, and holding office hours to provide students with additional help.

References

Available upon request