


MATTHEW OVERBY

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Research Interests: Physics-Based Animation, Geometry Optimization

EDUCATION

Doctor of Philosophy in Computer Science

University of Minnesota

Expected Fall 2021

Advisor: Rahul Narain

Master of Science in Computer Science

University of Minnesota Duluth

November 2014

Advisor: Pete Willemsen

Bachelor of Science in Computer Science, Minor in Mathematics

University of Minnesota Duluth

December 2011

EXPERIENCE

Amazon Science – Intern

Seattle, Washington, USA (remote)

June 2021 – September 2021

amazon.science

- In progress, check back later :)

z-emotion – Independent Contractor, Software Engineering

Seoul, South Korea

September 2020 – May 2021

z-emotion.com

- Develop cloth simulation algorithms for interactive garment design

Adobe – Creative Intelligence Lab Intern

Seattle, Washington, USA

Summer 2018 & Summer 2019

research.adobe.com

- Research methods for geometry optimization and collision response

Digital Domain – R&D Software Engineering Intern

Vancouver, British Columbia, CA

Summer 2017

digitaldomain.com

- Research and develop animation tools for simulating muscle and skin

University of Utah – Research Computer Scientist

Salt Lake City, Utah, USA

Fall 2015

mech.utah.edu/~pardyjak

- Research and develop microclimate simulation algorithms with GPGPU

PUBLICATIONS

Matthew Overby, Danny Kaufman, Rahul Narain. (2021). Globally Injective Geometry Optimization with Non-Injective Steps. *Computer Graphics Forum (Proc. SGP)*.

Carlo Bianchi, **Matthew Overby**, Peter Willemsen, Amanda D. Smith, Rob Stoll, Eric R. Pardyjak. (2019). Quantifying Effects of the Built Environment on Solar Irradiance Availability at Building Rooftops. *Journal of Building Performance Simulation*.

George E. Brown, **Matthew Overby**, Zahra Forootaninia, Rahul Narain. (2018). Accurate Dissipative Forces in Optimization Integrators. *ACM TOG (Proc. SIGGRAPH Asia)*.

Jie Li, Gilles Daviet, Rahul Narain, Florence Bertails-Descoubes, **Matthew Overby**, George E. Brown, and Laurence Boissieux. (2018). An Implicit Frictional Contact Solver for Adaptive Cloth Simulation. *ACM TOG (Proc. SIGGRAPH)*.

Matthew Overby, George E. Brown, Jie Li, Rahul Narain. (2017). ADMM \supseteq Projective Dynamics: Fast Simulation of Hyperelastic Models with Dynamic Constraints. *IEEE TVCG*.

Pascale Girard, Daniel F. Nadeau, Eric R. Pardyjak, **Matthew Overby**, Peter Willemssen, Rob Stoll, Brian N. Bailey, Marc B. Parlange. (2017). Evaluation of the QUIC-URB Wind Solver and QESRadiant Radiation-Transfer Model Using a Dense Array of Urban Meteorological Observations.. *Urban Climate*.

Rahul Narain, **Matthew Overby**, George E. Brown. (2016). ADMM \supseteq Fast Simulation of General Constitutive Models. *Proc. ACM SIGGRAPH/Eurographics SCA*.

Matthew Overby, Peter Willemssen, Brian N. Bailey, Scot Halverson, Eric R. Pardyjak. (2016). A Rapid and Scalable Radiation Transfer Model for Complex Urban Domains. *Urban Climate*.

Matthew Overby. (2014). A High Performance Framework for Coupled Urban Microclimate Models. *Master's Thesis - University of Minnesota Duluth*.

Brian N. Bailey, **Matthew Overby**, Peter Willemssen, Eric R. Pardyjak, Walter F. Mahaffee, Rob Stoll. (2014). A Scalable Plant-Resolving Radiative Transfer Model Based on Optimized GPU Ray Tracing. *Agricultural and Forest Meteorology*.

TALKS, ABSTRACTS, AND POSTERS

GPU Accelerated Surface Energy Balance Computations for Urban Environment Simulation. AMS Symposium on High Performance Computing for Weather, Water, and Climate. Phoenix, AZ. January 2015.

QUIC EnvSim: Radiative Heat Transfer in Vegetative and Urban Environments with Nvidia Optix. GPU Technology Conference. San Jose, CA. March 2014.

Simulating Radiative Transport for Vegetation in Complex Urban Environments with Green Infrastructure. AMS Symposium on the Urban Environment. Atlanta, GA. February 2014.
Awarded best student presentation.

A Highly Scalable Modeling Framework Based on GPU Technology for Simulating Radiative Transport in Complex Urban and Plant Canopies. ESA Sustainability: Urban Systems. Minneapolis, MN. August 2013.

Modeling Vegetative Heat Transfer in Urban Environments with OptiX. GPU Technology Conference. San Jose, CA. March 2013.

TECHNICAL SKILLS

Preferred Languages: C++, Python, Perl

Libraries/Frameworks: Eigen, GPGPU (CUDA), Intel MKL & TBB, OpenGL, OpenMP

Applications/Tools: CMake, Git, LaTeX, Linux, Mathematica, MATLAB, MS Visual Studio, SVN

ACTIVITIES

Google Summer of Code – Blender Foundation, 2020

SIGGRAPH Student Volunteer, 2017

Reviewer:

- ACM SIGGRAPH, 2019
- ACM VRST, 2015

Academic Outreach:

- Bulldog Science and Engineering Days, November 2013
- Impact of Green Infrastructure on Urban Microclimate, June 2013
- Engaging Elementary Students with Computer Science, May 2013
- Impact of Urban Form through Experiments and Visualization, June 2012