Matthew Dutson

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Education

University of Wisconsin-Madison **Madison, Wisconsin**

MS/PhD in Computer Science Fall 2018 - Present
- Interests: Computer vision, graphics, machine learning

University of Utah **Salt Lake City, Utah**

Honors Bachelor of Science in Physics Fall 2013 - Spring 2018
- Magnum cum laude
- Minors: Computer science, mathematics
- Thesis: Reconstruction of Cosmic Ray Geometry Using Cherenkov Backscattering

Publications

LIU, Y., KEIKHOSRAVI, A., PEHLKE, C. A., BREDFELDT, J. S., **DUTSON, MATTHEW**, LIU, H., MEHTA, G. S., CLAUS, R., PATEL, A. J., CONKLIN, M. W., INMAN, D. R., PROVENZANO, P. P., SIFAKIS, E., PATEL, J. M., AND ELICEIRI, K. W. Fibrillar collagen quantification with curvelet transform based computational methods. *Frontiers in Bioengineering and Biotechnology 8* (2020), 198

Coursework and Technologies

Selected coursework	Machine learning, computer vision, computer graphics, nonlinear optimization, algorithms, scientific computing, high performance computing, linear algebra, statistics, differential equations
Most experience	Python, C++, Java, Rust, UNIX, Git, NumPy, TensorFlow
Some experience	C, C#, Perl, JavaScript, MATLAB, CUDA, OpenMP, MPI, PyTorch

Work Experience

UW-Madison Computer Sciences **Madison, Wisconsin**

Graduate Research Assistant Spring 2020 - Present
- Advisor: Mohit Gupta
- Developing techniques for interpreting data from single-photon visual sensors.
- Exploring theory and applications of spiking neural networks.

Graduate Research Assistant Fall 2018 - Spring 2019
- Advisors: Jignesh Patel, Kevin Eliceiri
- Collaborator on Hustle, a scalable replacement for SQLite written in Rust.
- Wrote a Java application to generate synthetic images of biological fiber networks.

Esri **Redlands, California**

Map Exploration Software Intern Summer 2019
- Created tools for high-performance visibility analysis in ArcGIS Pro.
- Leveraged machine learning for detecting objects in 3D urban scenes.

University of Utah Physics & Astronomy **Salt Lake City, Utah**

Undergraduate Research Assistant Spring 2016 - Summer 2018

- Advisor: Douglas Bergman
- Conducted research on atmospheric cosmic ray detection techniques.
- Operated the Telescope Array observatory in Delta, Utah.

IM Flash Technologies **Lehi, Utah**

Process Software Intern Summer 2017

- Wrote Perl scripts to improve the efficiency of manufacturing defect sourcing.
- Improved existing software to reduce errors in process time estimation by 97 percent.

Process Software Intern Summer 2016

- Built a C++ computer vision application for detecting equipment malfunctions.

Teaching Assistantships

UW-Madison Computer Sciences **Madison, Wisconsin**

CS 559 - Computer Graphics Fall 2019

University of Utah School of Computing **Salt Lake City, Utah**

CS 2100 - Discrete Mathematics Fall 2017

University of Utah Physics & Astronomy **Salt Lake City, Utah**

Physics 2020 - General Physics II Spring 2017

Physics 2010 - General Physics I Fall 2016

Other Experience

UW-Madison Student ACM Chapter (SACM) **Madison, Wisconsin**

Events Committee Chair Fall 2019 - Present

- Coordinated volunteer efforts for department-wide, student-led events.
- Worked with the CS department to plan the annual Prospective Student Welcome Weekend.

Events Committee Officer Spring 2019

Lowell Elementary School **Madison, Wisconsin**

CS Club Leader Fall 2018

- Coached 4^{th} and 5^{th} graders in Scratch programming and computational thinking.
- Managed behavior and attention of a large group.

Salt Lake Valley Science and Engineering Fair **Salt Lake City, Utah**

Elementary Division Judge Spring 2016, Spring 2017

- Evaluated projects at a regional science fair for K-12 students.
- Provided advice and mentorship throughout the evaluation process.

University of Utah College of Science **Salt Lake City, Utah**

Science Day Volunteer Fall 2015, Fall 2016

- Offered logistical support at an annual outreach event for high school students.

Private Tutor Summer 2015 - Spring 2016

- Courses: College Algebra I, General Physics I & II, Physics for Scientists I & II, Introduction to Quantum Mechanics and Relativity
- Tutored 2-3 students each semester.