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

Fall 2019

CS 559 - Computer Graphics

Salt Lake City, Utah

Fall 2017

CS 2100 - Discrete Mathematics

University of Utah Physics & Astronomy

University of Utah School of Computing

Salt Lake City, Utah

Physics 2020 - General Physics II Physics 2010 - General Physics I

Fall 2016

Spring 2017

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 4th and 5th 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.