Matt Dutson

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Education

2018–Present **MS/PhD in Computer Science**, *University of Wisconsin-Madison*, Madison WI.
Interests: Computer vision, computer graphics, machine learning

2013–2018 **Honors BS in Physics**, *University of Utah*, Salt Lake City UT, *magnum cum laude*.
Minors: Computer science, mathematics
Thesis: Reconstruction of Cosmic Ray Geometry Using Cherenkov Backscattering

Publications

2020 **Fibrillar Collagen Quantification With Curvelet Transform Based Computational Methods**
Frontiers in Bioengineering and Biotechnology
Y. Liu, A. Keikhosravi, C. Pehlke, J. Bredfeldt, **M. Dutson**, H. Liu, G. Mehta, R. Claus, A. Patel, M. Conklin, D. Inman, P. Provenzano, E. Sifakis, J. Patel, and K. Eliceiri

Technical Skills

Languages	**C++**, **Java**, **Python**, **Rust**, C, C#, JavaScript, Perl
Machine Learning	**TensorFlow**, PyTorch
Scientific	**NumPy**, MATLAB
High Performance	CUDA, MPI, OpenMP
Other	**Linux**, **UNIX**, Git, LaTeX

Selected Coursework

Computer Science	Computer vision, computer graphics, machine learning, high performance computing, nonlinear optimization, algorithms, machine organization
Mathematics	Real analysis, statistics, partial differential equations, ordinary differential equations, linear algebra, calculus
Physics	Particle physics, quantum mechanics, special relativity, thermodynamics, classical physics

Industry Experience

2019 **Map Exploration Software Intern**, *Esri*, Redlands CA.
- Designed and implemented algorithms for high-performance viewshed analysis.
- Built an integrated machine learning application for automatically detecting building features in 3D urban scenes.

2017 **Process Software Intern**, *IM Flash Technologies*, Lehi UT.
- Improved the efficiency of wafer defect sourcing using an automated Perl pipeline.
- Reduced errors in process time estimation by 97 percent through online statistical analysis of historical data.

2016 **Process Software Intern**, *IM Flash Technologies*, Lehi UT.
- Created a C++ OpenCV computer vision application which successfully detected manufacturing equipment failures.

Research Experience

2020–Present **Research Assistant**, *UW-Madison*, Advised by Mohit Gupta.
- Creating image and video processing algorithms for single-photon visual sensors.
- Exploring the theory and applications of spiking neural networks.

2018–2019 **Research Assistant**, *UW-Madison*, Advised by Jignesh Patel and Kevin Eliceiri.
- Participated in the initial design and development of Hustle, a scalable replacement for SQLite written in Rust.
- Built a Java application for generating synthetic images of biological fiber networks.

2016–2018 **Research Assistant**, *University of Utah*, Advised by Douglas Bergman.
- Wrote C++ simulations of cosmic ray propagation and detection in order to test new detection techniques.
- Operated the Telescope Array observatory in Delta, Utah.

Teaching Experience

Fall 2019 **Teaching Assistant**, *UW-Madison*, Computer Graphics.

Fall 2017 **Teaching Assistant**, *University of Utah*, Discrete Mathematics.

Spring 2017 **Teaching Assistant**, *University of Utah*, General Physics II.

Fall 2016 **Teaching Assistant**, *University of Utah*, General Physics I.

2015–2016 **Private Tutor**, *University of Utah*.

Volunteer Experience

2019–Present **Events Committee Chair**, *Student ACM Chapter*, Madison WI.

2019 **Events Committee Officer**, *Student ACM Chapter*, Madison WI.

2018 **CS Club Leader**, *Lowell Elementary School*, Madison WI.

2016, 2017 **Project Judge**, *Salt Lake Valley Science and Engineering Fair*, Salt Lake City UT.

2015, 2016 **Science Day Volunteer**, *University of Utah College of Science*, Salt Lake City UT.