

Robert Edman, PhD

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Qualifications

- 10 years advanced technical experience working on domain specific research projects using mathematical and statistical software packages to prototype software solutions.
- \$3 million in grants from DARPA, AFRL, the Army, and the Navy, resulting in multiple publications, conference presentations, and additions to international software standards.
- 4 years experience in technology transfer to inter-disciplinary customers in government, academia, and private industry through direct user support, advanced training materials, workshops, and seminars.

Employment History

2017-present Adventium Labs, 111 3rd Ave S, Minneapolis, MN 55401
Senior Research Scientist

As a senior research scientist I write proposals for large projects (up to \$1M), lead projects with 4-5 team members, represent Adventium to standards committees and government agencies, and contribute to multiple other projects. Sample project: Optimization of medical logistics with supplies flowing to remote locations and evacuation of patients; results deployed on a DARPA high performance cloud.

2015-2017 Adventium Labs, 111 3rd Ave S, Minneapolis, MN 55401
Research Scientist

As a research scientist, I wrote proposals for small projects (under \$150k) and led projects with 2-3 team members while being a technical contributor on multiple other projects. Sample Project: Detection of vehicle make and model in aerial LIDAR data with detection probability of over 90% with low false positive rates.

2009-2015 Adventium Labs, 111 3rd Ave S, Minneapolis, MN 55401
Research Intern

As research intern I independently implemented solutions to technical problems using a variety of mathematical software packages and AI frameworks, regularly participated on interdisciplinary teams of 5-10 made up of experts with advanced degrees, graduate students, technical staff, and academic collaborators as an equal member.

2011-2016 University of Minnesota (MathCEP) Minneapolis, MN 55455
Workshop Leader/Instructor

As a workshop leader I communicated challenging technical material to workshops of 12-16 talented students in highly selective accelerated honors calculus program, created classroom activities, wrote and presented lectures, and led summer workshops.

Skills

Programming: Python (2.7, 3.0, Numpy, Scipy, Statpy, Jupyter), Java, C, C++, FORTRAN.

Mathematical Software: R, Mathematica, Matlab/Octave, Sage, Gap, SMT, MiniZinc.

Mathematics: Combinatorics, Graph theory, Convex Geometry, Optimization, Data Analysis, Mathematical Modeling.

Linux/Unix: 25 years experience with UNIX including development tools: git, svn, Makefiles, shell scripting.

L^AT_EX: Mathematical presentation software, including papers, proposals, and presentations.

Education

- 2015** PhD, Mathematics – University of Minnesota
Advisor: Victor Reiner
Thesis: Diameter and Coherence of Monotone Path Graphs
- 2014** MS, Mathematics – University of Minnesota
Advisor: Ezra Miller (Duke University)
Thesis: A-Hypergeometric Series
- 2003** BS, Mathematics (*Magna Cum Laude*) – Michigan Technological University
BS, Computer Science (*Cum Laude*) – Michigan Technological University

Awards and Honors

- 2018-2019** SIAM Science Policy Fellow – Committee on Science Policy membership and travel support to interact regularly policy makers and agency directors through to understand their needs for improvements in computing, data analysis, and machine learning technologies.
- 2016-2019** Navy SBIR Grant – PI on award for SLICED program for behavioral analysis of inter-operable avionics software (Solicitation N162–151). Phase II SBIR.
- 2016-2018** DARPA CASCADE program – Co-PI on CASCADE program focusing on foundational mathematics of complex systems of systems.
- 2016** Air Force SBIR Grant – Co-PI on computer vision project using topological methods for automatic target identification in LIDAR data (Solicitation: AF161–139).
- 2015** Army SBIR Grant – Award for RIVULETS program for run time acceleration of CFD codes on new Army HPC systems (Solicitation A15–102).
- 2012** Adventium Spot Award – Award for distinguished work on Navy MiCart (Mixed Criticality, Real-Time Virtualization Support) scheduling program.
- 2003-2004** Math in Moscow Scholarship – NSF/AMS Scholarship for undergraduate students to attend Math in Moscow Program for talented Math and Computer Science students.

Professional Associations

- AMS** American Mathematical Society (since 2004)
- ACM** Association of Computing Machinery (since 2001)
- SIAM** Society for Industrial and Applied Mathematics (since 2015)

Selected Publications

- Tyler Smith and Rob Edman. AADL annex for the FACE™ Technical Standard, edition 3.0, 2018
- Rob Edman, Pakawut Jiradilok, Gaku Liu, and McConville Thomas. Zonotopes whose cellular strings are all coherent. 2018 - (Available on ArXiv, submitted to European Journal of Combinatorics.)
- Tyler Smith, Rand Whillock, Robert Edman, Bruce Lewis, and Steve Vestal. Lessons learned in inter-organization virtual integration. In *SAE Technical Paper*. SAE International, 10 2018
- Steve Vestal, Robert Edman, Hazel Shackleton, John Shackleton, and Tyler Smith. A framework for compositional timing analysis of embedded computer systems. In *The 12th IEEE International Conference on Embedded Software and Systems (ICCESS 2015)*. IEEE, 2015

References

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