

# Adam Stewart

Graduate Student,  
University of Illinois at Urbana-Champaign

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## Education

- 2017 - Present **Ph.D., Computer Science**, *University of Illinois at Urbana-Champaign, College of Engineering*, Urbana, IL, GPA: 3.95.
- 2010 - 2014 **B.S., Science of Earth Systems**, *Cornell University, College of Engineering*, Ithaca, NY, Graduated *magna cum laude* with Honors, Cumulative GPA: 3.94, Major GPA: 4.04.  
Honors Thesis: Monitoring Glacial Velocity Variation in the Russian High Arctic Using Remote Sensing

## Research Experience

- 2018 - Present **Department of Computer Science, University of Illinois at Urbana-Champaign, Urbana, IL**, Research Assistant, with Professors Jian Peng and Kaiyu Guan.
- Performed interdisciplinary research on crop classification and crop yield prediction
  - Designed a U-Net to detect center pivot irrigation from satellite imagery
  - Developed large-scale machine learning algorithms to process 30 TB worth of satellite imagery
  - Tuned hyperparameters and fetched data on Blue Waters, a petascale supercomputer
  - Wrote deep learning programs using PyTorch, TensorFlow, and scikit-learn
- 2013 - 2014 **Department of Earth and Atmospheric Sciences, Cornell University, Ithaca, NY**, Undergraduate Research Assistant, with Professor Matthew E. Pritchard.
- Investigated the effects of climate change on glacial velocities, calving rates, and ice shelf breakup in the Russian High Arctic using remote sensing techniques such as feature tracking
  - Processed ASTER and Landsat satellite imagery using GMT, AROP, and ROI\_PAC software
  - Wrote Python, MATLAB, and Bash scripts to automate rapid processing of data
  - Designed new method of noise removal based on comparison of each pixel with its nearest neighbors
- 2012 - 2013 **Department of Earth and Atmospheric Sciences, Cornell University, Ithaca, NY**, Undergraduate Research Assistant, with Professor Larry D. Brown.
- Studied the application of seismic interferometry to monitor magma reservoir inflation at Montserrat
  - Researched the effects of seismic attenuation on aftershocks by analyzing records from dense station arrays in Maine and Virginia

## Professional Experience

- 2015 - 2017 **Argonne National Laboratory, Lemont, IL**, Assistant HPC System Administrator.
- Collaborated on the development of Spack, a Supercomputing PACKage manager written in Python and hosted on GitHub, enabling the installation of scientific software with multiple compilers and MPI libraries
  - Managed a supercomputing cluster composed of 720 36-core Intel Broadwell nodes, each with 128 GB of RAM, and 360 64-core Intel Knights Landing nodes, each with 96 GB of RAM, with a peak theoretical performance of 1.5 PFlops

- 2014 - 2015 **Lockheed Martin, Owego, NY**, Associate Software Engineer.
- Infrastructure Analytics program (IA)**
- Worked on a NYSEG/Iberdrola contract to develop software to detect downed power lines and flooding
  - Enhanced simulator for modeling LiDAR data of a town with houses, trees, poles, and power lines
  - Programmed primarily in C# in a .NET Framework using Microsoft Visual Studio
  - Investigated several different Continuous Integration (CI) software tools for build and test automation
- Remote Computer Reader program (RCR)**
- Worked on the machine learning software used by the USPS to sort and deliver mail
  - Enhanced Performance code (C) and overhauled internal testing tools (Perl, Bash, Python)
  - Performed a Failure Mode and Effects Analysis to track down bugs and discover monetary potential
  - Wrote Expect script to run Makefiles, ssh into remote machine, and ftp tar files to test bench
  - Cleared for a Secret Security Clearance in order to access classified address databases
- 2010 - 2012 **Paleontological Research Institution, Ithaca, NY**, Collections Assistant.
- Renovated and reorganized upper collections under NSF grant, allowing for easier access for researchers
  - Inventoried and relabeled older, more delicate specimens for organization and preservation
  - Cataloged Zinsmeister collection and updated master database of specimens
  - Photographed and documented Syracuse University collection journals

## Teaching Experience

- 2017 - 2018 **Department of Computer Science, University of Illinois at Urbana-Champaign, Urbana, IL**, Teaching Assistant.
- Served as a Teaching Assistant for Numerical Methods course of over 500 students
  - Held office hours, wrote homework assignments and exams, and answered course questions on Piazza
  - Presented a crash course lecture on Python, specifically for working with Numpy, Scipy, and Matplotlib
  - Managed course website through RELATE framework, including reference pages for course content
- 2014 **Department of Earth and Atmospheric Sciences, Cornell University, Ithaca, NY**, Teaching Assistant.
- Served as a Teaching Assistant for Satellite Remote Sensing Training for Biological Oceanographers
  - Taught an intensive graduate-level course composed of 20 oceanographers from around the world
  - Wrote Python lesson plan from scratch and answered questions about Python and IDL programming
  - Debugged satellite image processing scripts and managed Python module installation from source
- 2014 **Department of Computer Science, Cornell University, Ithaca, NY**, Undergraduate Python Consultant.
- Helped teach Introduction to Computing using Python and Transition to Object-Oriented Programming
  - Facilitated learning in a weekly lab session of 36 students, troubleshoot assignments, and graded exams
  - Held weekly consulting hours, working one-on-one with students to help clarify course material
- 2012 - 2013 **Department of Physics, Cornell University, Ithaca, NY**, Undergraduate Teaching Assistant, PhysTEC Program.
- Taught course material for Introduction to Mechanics, Heat/Electromagnetism, and Oscillations, Waves, and Quantum Physics courses to 50+ students
  - Led cooperative discussion and laboratory sections to promote understanding of physics material
  - Coordinated homework study groups to encourage collaboration on homework assignments
- 2008 - 2012 **Camp Barton, Boy Scouts of America, Trumansburg, NY**, Nature Director.
- Managed a department of 6 staff members, training them to become ecology counselors and leaders
  - Instructed between 3 and 5 weekly merit badges to up to 30 boy scouts ranging in age from 10 to 18
  - Rewrote lesson plans for all 20 merit badges, working with counselors to address various shortcomings
  - Established new off-site ecology program, introducing scouts to advanced topics at outside organizations
  - Maintained Camp Conservation Plan and oversaw conservation projects led by each Boy Scout troop

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## Publications

### Papers

- [1] Andrew K. Melkonian, Michael J. Willis, Matthew E. Pritchard, and Adam J. Stewart. Recent changes in glacier velocities and thinning at Novaya Zemlya. *Remote Sensing of Environment*, 174:244–257, 2016.

### Panels

- [2] Todd Gamblin, Adam J. Stewart, Johannes Albert von der Gönna, Marc Pérache, and Matt Belhorn. Spack community BoF. In *Supercomputing 2018*, Dallas, TX, Nov 2018.

### Tutorials

- [3] Gregory B. Becker, Massimiliano Culp, Matthew P. LeGendre, Mario Melara, Peter Scheibel, Adam J. Stewart, and Todd Gamblin. Managing HPC software complexity with spack. In *Supercomputing 2018*, Dallas, TX, Nov 2018. Full day.
- [4] Todd Gamblin, Gregory Becker, Massimiliano Culp, Gregory L. Lee, Matthew P. LeGendre, Mario Melara, and Adam J. Stewart. Managing HPC software complexity with spack. In *Supercomputing 2017*, Denver, CO, Nov 2017. Full day.
- [5] Adam J. Stewart. Managing HPC software complexity with spack. Lemont, IL, Jun 2017. Argonne National Laboratory. Two day.

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## Grants, Honors, and Awards

- 2014 Frank H. T. Rhodes Award
- 2010 - 2014 Dean's List
- 2013 Michael W. Mitchell Prize
- 2012 - 2013 Engineering Learning Initiatives Research Grant
- 2011 Gertrude Spencer Prize Honorable Mention
- 2010 Lockheed Martin Foundation Scholarship
- 2008 Eagle Scout

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## Outreach and Leadership Experience

- 2018 - Present Outreach Coordinator for Graduate Student Society
- 2015 Mentor for New Visions Job Shadowing Program at Lockheed Martin
- 2015 Test Proctor for Cornell Science Olympiad Invitational
- 2012 - 2014 President of Science of Earth Systems Student Association
- 2011 - 2012 Tae Kwon Do Team
- 2010 - 2012 Executive Board of Cornell Ski and Snowboard Club
- 2002 - 2012 Boy Scouts of America
- 2010 - 2011 Volunteer in Collections Department of Paleontological Research Institution

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## Computer Skills

- Programming Python, Bash, Perl, Ruby, Java, C, C#, MATLAB, OCaml, JavaScript, Make, Expect, Tcl, IDL
- Markup  $\LaTeX$ , Markdown, reStructuredText, YAML, HTML, CSS, XML, XPath, XSLT, Graphviz
- ML/DL PyTorch, TensorFlow, scikit-learn
- Soft. Eng. Travis CI, Codecov, Coveralls, PyTest, Flake8, Sphinx, GNU Debugger, Jira, Confluence, Crucible

VCS	Git (GitHub, GitLab, Bitbucket), Mercurial (Bitbucket), Subversion, CVS
Sys. Admin.	Spack, Lmod, Environment Modules, SoftEnv, Torque, Maui, Slurm, GPFS
IDEs	Vim, Sublime Text, Visual Studio, Eclipse, WordPress
Platforms	Linux (Fedora, RHEL, CentOS, Ubuntu, Mint), macOS, Windows