MICHAEL D. GALLOY

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EDUCATION

University of Kentucky *1993–1998*
Ph.D., Mathematics

- Major area: complex analysis

Rose-Hulman Institute of Technology *1989–1993*
B.S., Mathematics

- Sousley Award for Outstanding Senior in Mathematics
- Minors in Computer Science and Literature

APPOINTMENTS

Independent projects *2006–present*

- Develop and maintain open source project IDLdoc 3.x available at *github.com/mgalloy/idldoc*. Libraries such as the *lib/graphics* directory of IDL's distribution as well as David Fanning's popular Coyote library using IDLdoc formatted comments.
- Created a library of IDL routines, available at *github.com/mgalloy/mglib*.
- Created a unit testing framework, mgunit, available at *github.com/mgalloy/mgunit*.
- Created an IDL command line replacement, rIDL, available at *github.com/mgalloy/ridl*.
- Articles and demos posted at *michaelgalloy.com*.
- Self-published *Modern IDL: A Guide to IDL Programming*.
- Review books for Packt Publishing on Python topics such as matplotlib and parallel computing. Also have reviewed a book from Springer on computing fundamentals.

NCAR - High Altitude Observatory *2015–present*
Software Engineer/Programmer II

- Responsible for maintaining data pipelines for the Coronal Multi-Channel Polarimeter (CoMP) and Coronal Solar Magnetism Observatory K-coronagraph (K-COR) instruments.

Tech-X Corporation Boulder, CO *2009–2015*
Research Mathematician

- Responsible for obtaining funding and executing research in areas supporting scientific computation from government grants as well as commercial consulting contracts.
- Product manager for GPULib (a GPU accelerated IDL library for scientific computations) and FastDL (parallel computing libraries for IDL).
- Principal Investigator for Phase I/II NASA SBIR Grants, "A Rapid Model Fitting Tool Suite".
- Principal Investigator for IR&D in using GPUs for tomography.
- Principal Investigator for Phase II NASA SBIR Grant, "Remote Data Exploration with IDL".

Tech-X Corporation Boulder, CO *2006–2009*
Software Developer II

- Responsible for writing IDL and Python computational and visualization software in support of physicists.
- Principal Investigator for Phase I NASA SBIR Grant, "Remote Data Exploration with IDL". Contributed code to IDL-OPeNDAP bindings.
- Contributed to FastDL and GPULib projects. These projects provide IDL bindings for high performance computing libraries.

- Helped maintain VorpalView, an IDL GUI for visualizing VORPAL plasma physics data sets.
- Developed TxView, a Python GUI for visualizing several different physics data set formats.

Research Systems, Inc. Boulder, CO *2001–2006*
Senior Instructor/Consultant

- Responsible for all aspects of teaching IDL courses including creating and maintaining courseware.
- Taught IDL courses of all levels to over 750 students nationally and internationally. Instructor evaluations achieved a mean of 4.5 out of 5. Successfully developed content for custom courses based upon student request. Conducted shoulder-to-shoulder instruction and consulting.
- Advised and consulted on projects involving ENVI user functions and 3D visualizations.
- Through conducting internal classes and answering informal questions became a resource for tech support, sales engineers, instructors, and consultants at RSI.
- Contributed on a regular basis to the IDL user community with code and whitepapers on the RSI code library.
- Successfully helped ENVI development team by coding and bug finding/fixing.

Qwest/US WEST Boulder, CO *1999–2000*
Member, Technical Services

- Member of a group of mathematicians solving optimization problems involving acquisition and deployment of resources
- Designed, coded, and maintained SONET ring planning software in a team environment. Employed extreme programming in all phases of the project. Responsible for maintaining the performance metrics for the team. Using Java, implemented linear programming and graph theory algorithms.
- Created a variety of mathematical models to study DSL qualification.

TRW, Aurora, CO *1999*

- Researched algorithms involving genetic algorithms.
- Qualified for security clearance

Black Hills State University Spearfish, SD *1998–1999*
Assistant Professor

- Tenure track position in the Mathematics Department
- Taught Calculus sequence and College Algebra courses. Obtained "Excellent" student evaluations in each course.
- Invited to serve on Dean of Arts and Sciences' technology panel.

PUBLICATIONS

[1] Michael Galloy and David Fillmore, *SatelliteDL: a toolkit for analysis of heterogeneous satellite datasets*, American Geophysical Union Fall Meeting, December 2014.

[2] Michael Galloy, *Accelerated IDL using OpenCL*, American Geophysical Union Fall Meeting, December 2013.

[3] Michael D. Galloy, *Remote data access with IDL*, Technical Report GSC-16253-1, NASA, March 2013, http://ntrs.nasa.gov/search.jsp?R=20130011228.

[4] David Fillmore, Alexander Pletzer, and Michael Galloy, *A Python geospatial language toolkit*, American Geophysical Union Fall Meeting, December 2012.

[5] Michael Galloy, *GPU accelerated curve fitting with IDL*, American Geophysical Union Fall Meeting, December 2012.

[6] _____, *Using the Data Access Protocol with IDL*, Computing in Science and Engineering **13** (2011), no. 6, 90–95.

[7] _____, *Modern IDL: A Guide to IDL programming*, self-published, Boulder, CO, 2011.

[8] ———, *Accessing data via DAP in IDL*, American Geophysical Union Fall Meeting, December 2010.

[9] Peter Messmer, Paul Mullowney, Michael Galloy, David Fillmore, Brian Granger, and Keegan Amyx, *Astronomical data analysis on graphics cards*, American Physical Society, April 2008.

[10] Peter Messmer, Paul Mullowney, Mike Galloy, Brian Granger, Dan Karipides, David Fillmore, Nate Sizemore, Keegan Amyx, and Dave Wade-Stein, *GPU computing in high-level languages*, SIAM Conference on Parallel Processing for Scientific Computing, 2008.

[11] David Fillmore, Michael Galloy, and Peter Messmer, *Parallel IDL and Python for earth and space science data analysis*, American Geophysical Union Fall Meeting, December 2007.

[12] Michael Galloy, Peter Stoltz, Brian Granger, and Doug Dechow, *TxView: A tool for interactive analysis of remote accelerator simulation data*, Particle Accelerator Conference, 2007.

[13] Michael Galloy, *Making regular expressions your friends*, Technical report, RSI User-Contributed Library, 2005.

[14] Michael Galloy and Mark Piper, *Advanced topics in IDL*, 2004.

[15] Jason E. Fulman, Michael D. Galloy, Gary J. Sherman, and Jeffrey M. Vanderkam, *Counting nilpotent pairs in finite groups*, Ars Comb. **54** (1999).

[16] Michael Galloy, *Harmonic univalent mappings on the unit disk and the punctured unit disk*, Ph.D. thesis, University of Kentucky, Lexington, KY, 1998.

INVITED TALKS

- "Accessing Climate Data via OPeNDAP," *VISualize 2012*, Washington, DC, June 2012.
- "Remote Data Exploration," *2011 NASA Earth Science Technology Forum,* Pasadena, CA, June 2011.
- "Accessing remote data and the tools used in an IDL project," *VISualize 2011*, Washington, DC, April 2011.
- "GPU Accelerated Fitting with IDL via GPULib," *VISualize 2011*, Washington, DC, April 2011.
- "GPULib with IDL 8.0," *VISualize 2010*, Washington, DC, May 2010.
- "GPU computing with IDL and demonstration," *GPU Workshop*, Lawrence Berkeley National Laboratory, Berkeley, CA, July 2010.
- "GPULib with IDL 8.0," *IDL User Group Meeting*, Boulder, CO, February 2010.

SOFTWARE TECHNOLOGIES

- Languages: IDL (including use of the ENVI library), Python, C, CUDA, Java, Fortran
- Web: HTML, CSS, Javascript, Pylons (now Pyramid)
- Software development: Subversion, Git, CMake/CTest/CPack, issue tracking (RT, Trac, Redmine, GitHub)
- Operating systems: Mac OS X, Linux, Windows

REFERENCES

Available on request.