Russell J. Hewett — Curriculum Vitae (short form)

Russell J. Hewett
619 Broce Dr.
Blacksburg, VA 24060, USA

Phone (M): (540) 230-7912
russell.j.hewett@gmail.com
www.rjh.io

Education

Ph.D. in Computer Science (w/ Computational Science & Engineering option), December, 2011
University of Illinois at Urbana-Champaign
Thesis: *Numerical Methods for Solar Tomography in the STEREO Era*
Advisors: Michael T. Heath and Farzad Kamalabadi

B.S. *in Honors* in Computer Science, *Summa Cum Laude*, May, 2005
Virginia Polytechnic Institute and State University (Virginia Tech)
Thesis: *Wavelet Analysis of Solar Active Regions*
Advisors: Calvin Ribbens and Peter T. Gallagher

Research and Professional Experience

Aug 2018–Present	Assistant Professor, Department of Mathematics, Virginia Tech
Aug 2018–Present	Affiliate Faculty in Computational Modeling & Data Analytics, Virginia Tech
Jul 2017–Aug 2018	Chef de Project (Project Manager) for Inverse Problems, Uncertainty Quantification, and Machine Learning Project, Total E&P Research and Technology USA
May 2014–Aug 2018	Research Scientist, Computational Science & Engineering Department, Total E&P Research and Technology USA
Sep 2011–Apr 2014	Postdoctoral Associate, Department of Mathematics & Earth Resources Laboratory (by courtesy), Massachusetts Institute of Technology
Jan 2008–Jul 2011	Graduate Research Assistant, University of Illinois at Urbana-Champaign
Jun 2006–Sep 2006	Visiting Student, Trinity College Dublin
Sep 2004–Sep 2006	Junior Programmer, L3-Communications GSI, NASA Goddard Space Flight Center
May 2004–Aug 2004	Student Intern, NASA Goddard Space Flight Center
May 2003–Aug 2003	Student Intern, NASA Goddard Space Flight Center
Jun 2000–Aug 2001	Student Intern, NASA Goddard Space Flight Center

Awards, Honors, Achievements, and Fellowships

2008–2011	NASA Graduate Student Research Program (GSRP) Fellow
2005	First Place Industry Choice Award in Virginia Tech Undergraduate Research in Computer Science for "Wavelet analysis of solar active regions"
2005	Phi Beta Kappa
2001	First Place Judge's Choice Award in Virginia Tech Undergraduate Research in Computer Science for "The design and implementation of a refineable keyword search engine," w/ D. Arendt and J. Giacalone

Teaching Experience (selected)

Spring 2019	Instructor, CMDA 3634 Computational Science Foundations of CMDA, Virginia Tech
Fall 2018	Instructor, CMDA 2006 Integrated Quantitative Science, Virginia Tech
Fall 2018	Guest Lecturer, CS 6804 Physics and Machine Learning, Virginia Tech
Spring 2013	Recitation Instructor, 18.06 Linear Algebra, Massachusetts Institute of Technology
Spring 2013	Co-organizer, Earth Resources Laboratory Reading Group on Full Waveform Inversion, Massachusetts Institute of Technology

Invited Lectures & Summer Schools (selected)

Apr 2019	Invited Lecturer, *Theory and experience in solving inverse problems in geophysics workshop*, Uppsala University, Uppsala, Sweden
Sep 2018	Invited Instructor, *Summer School on Full Waveform Inversion: Mathematics and Geophysics*, Karlsruhe Institute of Technology, Karlsruhe, Germany
Jul 2013	Instructor for Computational Exercises, *Summer School on Introduction to the Mathematics of Seismic Imaging*, Mathematical Sciences Research Institute (MSRI), Berkeley, CA, USA

Software Projects

R&D Performance Seismic Inversion Suite for Total SA, proprietary, Architect and Developer

PySIT: Python Seismic Inversion Toolbox, open source, Principle Developer (www.pysit.org)

SunPy: Python for Solar Physics, open source, Developer and member of Board of Directors (www.sunpy.org)

Minor contributions: AstroPy, NumPy

Selected Publications

1. L. Zepeda–Núñez, A. Scheuer, R. J. Hewett, and , L. Demanet, "The Method of Polarized Traces for the 3D Helmholtz Equation," *Geophysics*, April, 2019.
2. N. Beams, A. Gillman, and R. J. Hewett, "A parallel implementation of a high order accurate solution technique for variable coefficient Helmholtz problems," *in review* Computers and Mathematics with Applications, December, 2018.
3. J. Chan, R. J. Hewett, and T. Warburton, "Weight Adjusted Discontinuous Galerkin Methods: Wave Propagation in Heterogeneous Media," *SIAM Journal on Scientific Computing*, 39 (6), A2935-A2961, 2017.
4. J. Chan, R. J. Hewett, Z. Wang, and T. Warburton, "Reduced Storage Nodal Discontinuous Galerkin Methods on Semi-structured Prismatic Meshes," *Computers & Mathematics with Applications*, 73 (5), 775-793, 2017.
5. M. N'Diaye, R. J. Hewett, A. Atle, and H. Calandra, "Optimized finite difference coefficients for the Helmholtz equation," 85th Annual Meeting, SEG, Expanded Abstracts, October, 2015.
6. L. Zepeda–Núñez, R. J. Hewett, M. Rao, and L. Demanet, "Time-stepping beyond CFL: a locally one-dimensional scheme for acoustic wave propagation," 83rd Annual Meeting, SEG, Expanded Abstracts, September, 2013.
7. M. Leinonen, R. J. Hewett, X. Zhang, L. Ying, and L. Demanet, "High-dimensional wave atoms and compression of seismic datasets," 83rd Annual Meeting, SEG, Expanded Abstracts, September, 2013.
8. R. J. Hewett, I. H. Jermyn, M. T. Heath, and F. Kamalabadi, "A Phase Field Method for Tomographic Reconstruction from Limited Data," *Proceedings of the British Machine Vision Conference*, pp. 120.1-120.11, August, 2012.
9. R. J. Hewett, M. T. Heath, M. D. Butala, and F. Kamalabadi, "A Robust Null Space Method for Linear Equality Constrained State Estimation," *IEEE Transactions on Image Processing*, Volume 58, Issue 8, pp. 3961-3971, August, 2010.
10. M. D. Butala, R. J. Hewett, R. A. Frazin, and F. Kamalabadi, "Dynamic Three-Dimensional Tomography of the Solar Corona," *Solar Physics*, Volume 262, Issue 2, pp. 495-509, February, 2010.

Skills, Programming Languages, and Tools

Programming Languages: Python, C, C++, Fortran, LaTeX

Version Control & Project Management: git, hg, JIRA, BitBucket, GitHub, GitLab

Languages: English (native), French (basic)

Other: Woodworking, 3D printing