
Education

Ph.D. (2015) and **M.Sc.** (2011) in Geological Sciences, *Brown University*, Providence RI
B.A. (2009) in Geophysics and Planetary Science, *Boston University*, Boston MA

Employment History

Research Scientist, School of Information Sciences, University of Illinois at Urbana-Champaign 2020 - present
Adjunct Officer of Research, Columbia University, Lamont-Doherty Earth Obs. 2016 – 2020
Data Science Consultant, University of Maryland 2018-2020
Data Science Consultant, PlanetEcosystems Inc., Boulder CO 2017-2019
Postdoc, Columbia University, Lamont-Doherty Earth Observatory 2015-Aug. 2016
Sponsored Scientist, Department of Geological Sciences, Brown University 2014-2015
Research Assistant, Department of Geological Sciences, Brown University 2009-2014
Teaching Assistant, Department of Geological Sciences, Brown University 2010, 2012
Undergraduate Research Assistant, Center for Space Physics, Boston University 2007-2009
Undergraduate Research Assistant, Dept. of Earth Sciences, Boston University 2008-2009

Employment Highlights

Adjunct Officer of Research, Columbia University (Lamont-Doherty Earth Obs.)

Visualizing seismological datasets with yt

- Used the yt platform for volume rendering of seismological datasets
- Wrote 3D interpolation of spherical data to cartesian coordinates
- Added georeferencing to 3D renderings through projection of shapefile data to 3D cartesian coordinates and rendering domain boundaries of a spherical chunk.

Adjunct & Postdoctoral Researcher, Columbia University (Lamont-Doherty Earth Obs.)

The Very Broadband Rheology Calculator

- Wrote and optimized methods for calculating material properties of rocks in MATLAB for the open source Very Broadband Rheology Calculator (<https://vbr-calc.github.io/vbr/>).
- Managed the open source git repository and trained new users and developers.
- Conducted statistical analyses using Bayesian Inference to understand tradeoffs in calculation methodology and interpretations of observations.
- Authored conference abstracts, journal articles and grant proposals.

Data Science Consultant, Department of Geology at University of Maryland

Seismic Model Visualization and Analysis

- Designed an interactive python web-application and command line API for visualization and analysis of seismological data sets.
- Used pydata packages for data IO and analysis (pandas, numpy, xarray, netcdf4)
- Constructed a Mongo database and wrote Wordpress plugins for user interactions.
- Contributed to conference abstracts and presentations.

- Used conda virtual environments for python package management

Employment Highlights Continued

Data Science Consultant, Planet Ecosystems, Inc.

Statistical analysis of home energy use efficiency programs

- Conducted statistical analyses related to home energy use efficiency programs and provided full stack support.
- Built new software in python for analysis of hourly electrical use for millions of customers using batch processing in a HPC environment on Amazon servers.
- Trained team members and wrote documentation on using the new analysis software.
- Maintained data pipelines from web APIs and Mysql, Cassandra databases.
- Addressed bugs and managed projects through JIRA ticket tracking and git.

Research Assistant, Department of Geological Sciences, Brown University

Ph.D. and M.Sc. research in numerical geodynamics

- Implemented computational fluid dynamics algorithms in MATLAB and Fortran to conduct novel research in geodynamics.
- Used open source PETSc linear algebra libraries for Fortran in solving systems of partial differential equations.
- Tutored an undergraduate researcher in geodynamics and code development.
- Authored conference abstracts and journal articles.

Undergraduate Research Assistant, Department of Earth Sciences, Boston University

Research in numerical geodynamics

- Installed and maintained Citcom, a finite element code for simulating mantle flow written in C and parallelized via MPI, on a local computer cluster.
- Used ParaView for visualization of 3D model output.

Selected Publications & Abstracts

Havlin, Holtzman, & Hopper (2020, *in review*), “Inference of thermodynamic state in the asthenosphere from anelastic properties, with applications to North American upper mantle,” *Physics of the Earth and Planetary Interiors*.

Accardo, Gaherty, Shillington, Hopper, Nyblade, Ebinger, Scholz, Chindandali, Wambura-Ferdinand, Mbogoni, Russell, Holtzman, **Havlin** and Class (2020, *in review*), “Thermo-chemical modification of the Upper Mantle beneath the Northern Malawi Rift Constrained from Shear Velocity Imaging,” *Geochemistry, Geophysics, Geosystems*.

Hopper, Gaherty, Shillington, Accardo, Nyblade, Scholz, Chindindali, Ferdinand, Mgboni, Mulibo, Holtzman and **Havlin** (2020, *in review*), “Preferential localised thinning of lithospheric mantle in the melt-poor Malawi Rift,” *Nature Geoscience*.

Moulik, Maguire, **Havlin**, Gao and Lekic (2019), “Rapid prototyping, interactive visualization and data validation methods for models of planetary interiors,” AGU Fall Meeting

Havlin and Parmentier, (2014), “Implications for melt transport and source heterogeneity in upwelling mantle from the magnitude of Sp converted phases generated at the onset of melting,” *Geophysical Research Letters*.

Havlin, Parmentier and Hirth (2013), “Dike propagation driven by melt accumulation at the lithosphere-asthenosphere boundary,” *Earth and Planetary Science Letters*.

Federal Grants

B. Holtzman (PI) and **C. Havlin** (Co-PI), “Mapping variability in the thermo-mechanical structure of the North American Plate and upper mantle”, NSF EAR Award 1736165, 2017-2019