Ian Rose

Data science, software engineering, geophysics

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Employment

City of Los Angeles / Argus Associates — 2019-

Data Engineer/Data Scientist: Full-time contractor with the City of Los Angeles' nascent Data Science and Predictive Analytics team. In my capacity supporting a small team of data analysts I have a number of roles:

- Developing software tooling for government data analysis work
- Deploying and maintaining cloud infrastructure for the team
- Data engineering and ETL writing
- Data analysis work around:
  - dockless mobility
  - city planning and zoning
  - homeless shelter management
  - COVID-19 response

Quansight — 2018-2019

Software Engineer: Contractor developing tools and integrations for data scientists. Much of my work focused on improving the integration of a GPU-based relational database (OmniSci) with the broader Python data science ecosystem.

Berkeley Institute for Data Science — 2016-2019

Postdoctoral Fellow: As a member of the Peréz group I joined the JupyterLab development team, working on features like the third-party extension system, and real-time collaboration. My work there also brought me into collaboration with related groups such as the Binder team and Pangeo.

Education

University of California, Berkeley — 2009-2016

Ph.D. Earth and Planetary Science
Thesis: True polar wander on convecting planets

Yale University — 2005-2009

B.S. (Geology and Physics)

Selected software projects and contributions

JupyterLab

JupyterLab is a next-generation front-end for Jupyter kernels. In addition to developing the core project, I have also helped to develop and shepherd the

extension ecosystem, including extensions for working with Dask, GitHub, Google Drive, and LaTeX.

Interactive Earth

Interactive Earth is a piece of educational software I wrote for teaching about the physics of planetary interiors. It simulates real-time interactive simulations of fluid and solid dynamics, including thermal and themochemical convection and seismic wave propagation. It is written in C++/OpenGL, deployed to the web using WebAssembly/WebGL.

Intake ecosystem

I am a contributor to the Intake project, and author/maintainer of several intake drivers. These include drivers for GeoPandas and DCAT catalogs, which back many government open data portals.

PostGIS-Ibis-GeoPandas integration

At the City of Los Angeles I support novice/intermediate Python data analysts who need to interact with geospatial data stored in traditional relational databases. To that end, I contributed support for geospatial operations to the Ibis project, targeting PostGIS databases. This allows the user to write pythonic, pandas-like expressions which generate SQL to query the database. enabling a smooth transition from large, possibly cloud-based vector geospatial data to an in-memory GeoDataFrame.

Technical Skills

Programming languages

C/C++, JavaScript, TypeScript, Python, SQL, HTML, CSS, OpenGL

Computational methods

PyData stack, GIS analysis, visualization and mapping, ordinary/partial differential equations, statistical modeling and inference, Monte Carlo methods

Web development

React, webpack, node/npm, Vega/VegaLite, WebGL, Leaflet, asynchonous and event-driven programming

Publications

Swanson-Hysell, N., Ramezani, J., Fairchild, L., and Rose, I.. Failed rifting and fast drifting: Midcontinent Rift development, Laurentia's rapid motion and the driver of Grenvillian orogenesis. In Press, Geological Society of America Bulletin. 2019.

Rose, I. and Buffett, B.. Scaling for rates of true polar wander in convecting planets and moons. Physics of the Earth and Planetary Interiors, Volume 273. 2017.

Rose, I., Buffett, B., and Heister, T.. Stability and accuracy of free surface time integration in viscous flows. Physics of Earth and Planetary Interiors, Volume 262. 2017

Cottaar, S., Heister, T., Rose, I., and Unterborn, C.. BurnMan: A lower mantle mineral physics toolkit. Geochemistry, Geophysics, Geosystems, 2014.

Selected talks and conference proceedings

Rose, I. JupyterLab, PyData Los Angeles, 2018

Colbert, C., and Rose, I. JupyterLab, JupyterCon, 2018

Colbert, C., Granger, B., and Rose, I. JupyterLab, the next-generation Jupyter frontend, JupyterCon, 2017

Colbert, C., Granger, B., and Rose, I. JupyterLab + Realtime Collaboration, PyData Seattle, 2017

Rose, I. Interactive investigations into planetary interiors. AGU Fall Meeting 2015

Rose, I. True polar wander in convecting planets. Computational Math Seminar, Clemson University, April 2014}

Cottaar, S., Heister, T., Rose, I., and Unterborn, C., An introduction to BurnMan. Computational Infrastructure for Geodynamics Webinar, October 2015