Alex Gurvich, Ph. D.

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data scientist, data visualization expert, software engineer, & web developer

Overview

An independent, adaptable, and proficient data storyteller with expertise in creating accessible interpretations of complex data in a web environment. Well versed in creating computationally efficient analysis pipelines to extract meaningful takeaways and advance understanding of underlying processes.

Professional Summary

legend: • technical • interpersonal

Research in Theoretical Astrophysics *2016-2023*

- Led self-directed data analysis projects to synthesize meaningful interpretations from complex data
- Employed state-of-the-art statistical analysis methods to explore high dimensional datasets, identify key features, and quantify their significance
- Communicated analysis methods and results through authored publications and oral presentations
- Worked effectively as part of, and often led, teams with diverse backgrounds and skillsets

Interactive Visualization of Tens of Millions of Datapoints in a Web-browser with Firefly *2016-2023*

- Partnered with a co-developer to create a scaleable 3D data visualization application using three.js
- Built a fully configurable tree-based user interface programmatically generated with d3.js to create customized visualizations for different audiences
- Provided a convenient API to enable users to create new Firefly visualizations and host them online
- Wrote and maintained comprehensive user-facing documentation and API reference using Sphinx
- Responded to user reports to enhance software features and fix software bugs
- Code is open source and available at firefly-viz.com alongside documentation

Visualization of Simulation data with FIRE Studio *2017-2023*

- Took ownership of and overhauled legacy code to implement new optimizations
- Expanded upon existing hard-coded recipes to create a new simple, flexible, and composable API
- Code is open source and available at github.com/agurvich/FIRE_studio
- Defined new procedures to support users with Github issue templates

Public Outreach at the Adler Planetarium and Other Venues *2017-2023*

- Collaborated with Adler Planetarium staff scientists as a consultant to develop a new exhibit using Firefly to create public-facing interactive data stories
- Broke down complex topics to different levels to accomodate audiences with different backgrounds
- Wrote and supervised the editing of a library of educational pamphlets for a public audience

GPU Accelerated Numerical Integration of Differential Equations with WIND *2018-2019*

- Created a software to solve general systems of coupled differential equations
- Efficiently solved millions of systems of equations in parallel using NVidia's CUDA runtime
- Profiled and optimized code using NVidia's NSIGHT Compute performance tracker
- Code is open source and available at github.com/agurvich/WIND

Technical Skills

Languages: Python, C, CUDA, Fortran, Javascript, HTML, CSS, Markdown, Bash

Tools: Matplotlib, Plotly, React.js, d3.js, three.js, Node.js, Flask, Paraview, Adobe CS, Canva, Keynote, M.S. Office, Git & Github

Techniques: Machine Learning, Non-Parametric Model Fitting, Bayesian Inference, MCMC, Mathematical Modeling, Simulation Development and Analysis

Operating Systems: Unix, MacOS, Windows

Cloud Platforms: Microsoft Azure

Education

B.S. Physics (2016),
Carnegie Mellon University

M.S. (2019) & **Ph.D.** (2023) Theoretical Astrophysics,
Northwestern University