Yunlin Zeng

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Education

Georgia Institute of Technology, Ph.D. in Physics — Aug 2020 – Aug 2025

University of California, Santa Barbara, BS in Physics — Sept 2015 – June 2019

- GPA: 3.90/4.00. Graduation with the highest honors; Highest academic honors for upper division physics courses; Dean's Honors x 6

Research Projects

Graduate Researcher in Full-Waveform Variational Inference, School of Computational Science and Engineering, Georgia Tech – Atlanta, GA — Jan 2024 – July 2024

- Engineered an advanced variational inference framework with normalizing flows to efficiently solve the seismic inverse problem, enhancing the subsurface seismic imaging.
- Implemented robust uncertainty quantification methods to assess and interpret the stability and accuracy of seismic imaging predictions.
- Developed stochastic resampling and data augmentation techniques, and improve the generalization capabilities of initial migration velocity models in seismic analysis.

Graduate Researcher in Orbital Dynamics, Physics Department, Georgia Tech – Atlanta, GA — Jan 2020 – Dec 2021

- Applied Bayesian inference and parallel-tempering MCMC algorithms to constrain the orbital parameters of the Gliese 86 binary system, integrating diverse data types such as radial velocity and high-resolution imaging.
- Conducted simulations of stellar evolution within binary systems, reconstructed historical orbital dynamics, and contributed to theories of planet formation in truncated stellar disks.
- Investigated disk-satellite interactions within circumstellar disks to provide insights into planet formation dynamics under extreme conditions.

Software Developer and Research Analyst, Physics Department, UC Santa Barbara – Santa Barbara, CA — June 2019 – Dec 2019

- Developed 'orvara', an open-source Python software for Bayesian analysis of Keplerian orbits.
- Enhanced the computational efficiency by 5-10x over traditional methods and used low-level memory management to avoid python overheads.
- Applied MCMC methodologies to robustly sample posterior distributions of stellar and planetary orbits, ensuring high accuracy and reliability of model predictions.
- Authored several utility functions and extended the software's capabilities to infer and visualize the results, broadening its applicability and user base.

Graduate Researcher in Computational Chemistry, School of Physics, Georgia Tech – Atlanta, GA — June 2021 – June 2023

- Led the design and implementation of a graphical user interface for the Force Field Toolkit (ffTK), streamlining the parameterization of small molecules based on quantum mechanical calculations.
- Integrated Psi4, an open-source quantum mechanics package, with ffTK, facilitating access to advanced computational tools for the scientific community.
- Enhanced the toolkit's functionality, including new command integrations and expanded input/output options, to support a wider range of quantum chemical computations.

Selected Publications

Enhancing Full-Waveform Variational Inference through Stochastic Resampling and Data Augmentation — Jan 2024

Yunlin Zeng, Rafael Orozco, Ziyi Yin, Felix J. Herrmann

Technologies

Languages: Python, Julia, Cython, TCL, Fortran, Mathematica, MATLAB

Technologies: Applied Machine Learning (Scikit-learn), Deep learning (PyTorch, TensorFlow), Signal Processing

Quick Guide

- Each section title is arbitrary and each section contains a list of entries.
- There are 7 unique entry types: *BulletEntry*, *TextEntry*, *EducationEntry*, *ExperienceEntry*, *NormalEntry*, *PublicationEntry*, and *OneLineEntry*.
- Select a section title, pick an entry type, and start writing your section!
- Here, you can find a comprehensive user guide for RenderCV.