CHAD BUSTARD, PHD

DATA SCIENTIST | ASTROPHYSICIST

Versatile data scientist and astrophysicist with 10 years of experience in Python-based data analysis, distributed computing, and large-scale modeling. Proficiency building, interpreting, and deploying machine learning models

PROFESSIONAL EXPERIENCE

POSTDOCTORAL FELLOW **September 2020 - Present**

KAVLI INSTITUTE FOR THEORETICAL PHYSICS | SANTA BARBARA, CA

Building and Interpreting Deep Learning Models

- Developed a novel technique to reveal particle properties from astronomical images using neural networks (Bustard and Wu, in prep)
- Engineered a pipeline to clean and manipulate TBs of unstructured simulation data, train and fine-tune discriminative and generative models, and interpret results via image manipulation and saliency maps (PyTorch, Python, Scikit-learn, SciPy, NumPy, Jupyter, Plotly, git)
- Generated a suite of simulation images and conducted rigorous time-series and structural image analysis using data science tools (Python, SciPy, Pandas, NumPy, Plotly), resulting in 2 publications

Distributed Computing

- Awarded > 15 million CPU hours of compute time supporting multiple postdoc and PhD projects by leading a successful proposal and performing code performance tests on 4 supercomputer architectures
- Created and simulated detailed models of galaxies and gas dynamics using job scheduling on national supercomputers (C++, Fortran, bash)

GRADUATE RESEARCH FELLOW **June 2014 - August 2020**

UNIVERSITY OF WISCONSIN - MADISON | MADISON, WI

Software Development

- Designed and built new astrophysics modules and integrated them with massively parallel codebases, contributing new capabilities and data products for multiple international collaborations (C++, Fortran, Python)

Data Analysis and Communication

- Conducted exploratory and diagnostic analysis on > 10 TBs of simulation data by leveraging and advancing open-source software (Python, Pandas, matplotlib, NumPy), resulting in 14 papers (8 first-author, h-index: 9) in high-impact journals and >40 conference and seminar presentations

AWARDS AND OTHER ACTIVITIES

- Accepted to the Fall 2023 **Climatebase Fellowship** (Cohort 4)
- Awarded a highly-selective **National Science Foundation (NSF) Graduate Fellowship** for three years of fully-funded research stipend and tuition
- Sculpted and **advised projects for 6 junior researchers** over the past 8 years
- **Organized orientations, events** for >300 postdocs as a UCSB union steward

CONTACT

(505) 417-8008
Madison, WI 53704
bustardchad@gmail.com
GitHub | LinkedIn | Blog

SKILLS

LANGUAGES: Python, C/C++, Fortran, SQL, MatLab

LIBRARIES & FRAMEWORKS: PyTorch, TensorFlow, Pandas, Scikit-learn, SciPy, NumPy, matplotlib, Plotly, Seaborn, Jupyter, bash, LaTeX, Quarto

TOOLS & PLATFORMS: Unix/Linux, git, Docker, Kubernetes, Google Cloud Platform, SLURM, Jira

COURSES / CERTIFICATIONS

Machine Learning Engineering for Production (MLOps)
DeepLearning.AI on Coursera (August 2023)
(Kubernetes, Google Cloud Platform (GCP), Docker, TensorFlow Extended)

Deep Learning Specialization
DeepLearning.AI on Coursera (May 2023)
(TensorFlow, CNNs, RNNs, Transformers)

Climate Change AI Summer School
Climate Change AI (June-August 2023)
(Geospatial analysis, optimization)

EDUCATION

PH.D. PHYSICS
University of Wisconsin | Madison, WI
August 2020

B.S. ASTROPHYSICS
B.A. MATHEMATICS
Rice University | Houston, TX
May 2013