CHAD BUSTARD, PHD

DATA SCIENTIST | ASTROPHYSICIST

Versatile data scientist and astrophysicist with 10 years of experience in Python-based data analysis, distributed computing, and complex 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

- Conceptualized and developed a novel deep learning model with >85% accuracy to reveal particle properties in astronomical data, resulting in a pending publication (Bustard and Wu, in prep)
- Engineering a pipeline to preprocess TBs of unstructured simulation data, train and deploy CNN and U-net models, and interpret results via image manipulation and saliency maps (PyTorch, Python, Scikit-learn, SciPy)
- Gained exposure to e.g. graph neural networks, diffusion models, JAX by contributing to a 10-week program on Data Science and Galaxy Evolution

Distributed Computing

- Secured over 15 million CPU hours of compute time supporting multiple postdoc and PhD projects by leading a successful project scoping proposal showing code performance statistics on 4 distributed systems
- Created and simulated detailed models of galaxies and gas dynamics on national supercomputers (C++, Fortran, bash), providing valuable data products for a successful grant proposal and a 10-person research team

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

UNIVERSITY OF WISCONSIN - MADISON | MADISON, WI

Software Development

- Contributed new capabilities to 2 massively parallel codebases by building and integrating new astrophysics modules (C++, Fortran)

Data Analysis and Communication

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

AWARDS AND OTHER ACTIVITIES

- Admitted 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
- **Advised 6 researchers** on multi-year data science projects
- **Organized orientations, events** for >300 postdocs as a UCSB union steward

CONTACT

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Madison, WI 53704
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GitHub | LinkedIn | Personal

SKILLS

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

LIBRARIES & FRAMEWORKS: PyTorch, TensorFlow, Pandas, Scikit-learn, SciPy, NumPy, Jupyter, Unix/Linux, bash, LaTeX

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

COURSES / CERTIFICATIONS

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

Deep Learning Specialization
DeepLearning.AI (May 2023)
(TensorFlow, CNNs, 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