Matthew Bundas

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EDUCATION

New Mexico State University — Las Cruces, NM
Master of Science in Computer Science GPA: 4.0/4.0 — Dec, 2021

Michigan State University — East Lansing, MI
Bachelor of Science in Astrophysics GPA: 3.6/4.0 — May, 2019

EXPERIENCE

Graduate Research Assistant, New Mexico State University — Aug, 2019 - Dec 2021

- Completed software projects in AI, Computer Vision and KRR for national scientific organizations
- Developed deep learning solutions in Python/TensorFlow for NASA's GLOBE Observer Program, a project imploring the public to gather image data used to study global landscape characteristics
  - Built novel deep learning framework incorporating active and semi-supervised learning
  - Outperformed human classification, overcame real-world dataset issues of imbalance, noise etc
  - Designed, implemented SQL database and used HPC resources to facilitate large-scale experiments
- Advanced the National Institute of Standards and Technology's (NIST) Cyber-physical System (CPS) Framework, a knowledge representation and reasoning approach to managing a CPS
  - Engineered python-based GUI application facilitating creation of a CPS's digital representation
  - Developed logic-based metrics to evaluate a CPS's trustworthiness and cybersecurity
  - Extended CPS Framework through addition of AI-related stakeholder concerns
  - Collaborated directly with various external teams at NIST and Saint Joseph's University
- Additonally, served two semesters as TA aiding instruction of introductory computer science courses

Observatory Operator, Michigan State University — Mar, 2017 - Aug 2019

- Responsible for end-to-end operation of astronomical observatory, completed 1,000+ observations
- Reduced time-series data using python scripts and AstroImageJ, distributed data to community
- Promoted to expert observer leadership role, trained peers in final 1+ year
- Volunteered at public observing nights, operating telescopes, organizing/facilitating activities

Undergraduate Research Assistant, Michigan State University — May, 2018 - June 2019

- Facilitated 300k core-hour 2-D magnetohydrodynamic high-mass star simulations using FLASH
- Implemented newly theorized fusion rates and studied their impact on high-mass star's evolution
- Visualized and analyzed nuclear energy generation, convection strength in simulations using Python

OTHER PROJECTS

- Astronomical object classification using deep learning methods with Python/TensorFlow
- Modeling low-mass main sequence star characteristics in Python using manual integrators
- Grid-based global pandemic simulation and map interface created using Java
- Exploration of statistics and influencing factors of NFL rush play outcomes performed in R

ADDITIONAL

- Programming Languages: Python, C, C++, Java
- Other Skills: GitHub, SQL, TensorFlow, High Performance Computing, Statistics, Agile Development
- Relevant Coursework: AI I&II, Deep Learning, Machine Learning, Database Management I&II, Comp. Modeling I&II, Comp. Physics, Parallel Computing, Comp. Statistics
- Published in IEEE, PRIMA, KR, TPLP journals. Tutorials performed for KR, IJCAI