Locke Patton

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Education

Harvard University — **Cambridge, MA**
Masters in Astrophysics | Pierce Fellowship — *2018–2021*

University of Washington — **Seattle, WA**
Bachelor of Science in Physics & Astronomy — *2015–2018*

Portland State University | Portland Community College — **Portland, OR**
Early College Student | PSU Dean's List — *2012–2014*

Awards

Pierce Fellowship: Harvard University — *2018-2021*
Prestigious scholarship awarded to the applicant demonstrating extraordinary promise

John P. and Carol J. Merrill Graduate Fellowship: Harvard University — *2019*

Chambliss Astronomy Achievement Graduate Award: American Astronomical Society — *2019*

UW Mary Gates Research Scholar: Two-time Winner — *2016*

Relevant Experience

Harvard PhD Program | Graduate Student in Astrophysics — **Cambridge, MA**
Conducted multiple independent research projects for my Masters dissertation — *Fall 2018 – Fall 2021*

- Developed slurm and `Python` Bayesian nested sampling models of >200 galaxies on high performance computing cluster with 100,000+ computing hours, producing an accessible tool for my colleagues to model what would take months in less than five minutes
- Scrubbed disparate data sources using `Python` into json model-ready format of my own design, producing a first of its kind accessible dataset
- Using linear regression in `Python` , I found statistically significant inconsistencies between data sources and pushed to maintain best practices
- Visualized and interpreted resulting population statistics for the complete set of superluminous supernovae type I host galaxies, delivering three key outcomes to my team

Final Project | MCMC Parameter Estimation Model — **Cambridge, MA**
'Data Analysis for Physicists' Graduate Course — *2020*

- Constructed Bayesian and Frequentist inference and parameter estimation `Python` models from scratch, outperforming classmates in code time runs
- Collaboratively implemented MCMC hierarchical Bayesian rotation model of central supermassive black hole, utilizing git version control and predicting a result prior to collaboration publications

Harvard University Teaching Fellow — **Cambridge, MA**
Course: Methods of observational astronomy — *Fall 2018 – Fall 2021*

- Used skills in bash, data analysis, modeling, GitHub and pip to teach first time `Python` learners
- Developed and taught lesson plans and example `Python` workflows, bringing six students from complete beginners to science ready in 4 months
- Mentored students through unique individualized coding projects, producing six original science results in 3 weeks

Undergraduate Research Projects — **Seattle, WA**
Prof. Emily Levesque, Prof. Jessica Werk at University of Washington — *Fall 2016 - 2019*

- Designed, coded, implemented and published a sonification tool in `Python` to help blind individuals access data - outreached and tested my code within communities, ultimately improving access
- Under my own initiative, reverse-engineered `C++` code into `Python` package, delivering a bimodal membership distribution code, distilling 3 day runtime down to <30 seconds

Programming & Skills

Technical Competency: AB Testing | Bayesian inference | GitHub | Test Driven Development | Machine Learning | Packaging | High Performance Cluster Computing | MCMC | Bayesian and Frequentist Inference

Python: pandas | numpy | matplotlib | os | json | emcee | dynasty | Jupyter | visualization

Additional Languages: SQL | Bash scripting | Java, Matlab, `C++` Exposure | Mathematica | Latex | French