Maria Patterson

http://mtpatter.github.io
maria.t.patterson@gmail.com | 812.345.2654

http://linkedin.com/in/mariatpatterson

BIG DATA • PROJECT MANAGEMENT• PROGRAMMING

EXPERIENCE

UNIVERSITY OF WASHINGTON | Research Scientist, Department of Astronomy

Aug 2016 – present | Seattle, WA

- Building the next generation algorithms and software tools for the Large Synoptic Survey Telescope.
- Designing and benchmarking a Python-based streaming data ecosystem for astronomical alert distribution and processing using Kafka, Avro, and Spark.

UNIVERSITY OF CHICAGO | Director of the Open Science Data Cloud

Mar 2014 – Jul 2016 | Chicago, IL

- Scientific Lead for a petabyte scale community science cloud, managing cloud service allocations and training for multi-disciplinary groups of scientists, including the NOAA Big Data Project.
- Planned and organized data intensive science and computing fellowship and workshop program for graduate students and supervised data science projects for three undergraduate students.

Postdoctoral Research Professional, Center for Data Intensive Science

Sep 2013 – Jul 2016 | Chicago, IL

- Developed computational algorithms for detecting spatial patterns in geo-coded medical records.
- Developed and maintained an analytic pipeline of daily automated machine learning algorithms for cloud processing and analysis of NASA satellite data using Python, Hadoop, Accumulo, and Storm.
- Modeled the distribution of data stored on distributed file storage systems using Monte Carlo methods to analyze hardware performance issues.

UNIVERSITY OF EDINBURGH | Visiting Fellow, Royal Observatory & School of Informatics

Jun 2013 – Aug 2013 | Edinburgh, Scotland

- Developed a Python tool to test query speeds and compare system utilization in row-oriented vs. column-oriented database implementations of the astronomical database for the VISTA Variables in the Via Lactea (VVV) Survey.

SAPLING LEARNING, INC. (MACMILLAN) | Astronomy Content Author and Reviewer

Apr 2013 – Nov 2013 | Remote/Online

- Created questions and solutions of varying difficulty to test students' understanding of astronomical concepts in an online interactive system for higher education course homework.

EDUCATION

NEW MEXICO STATE UNIVERSITY | PhD, Astronomy

May 2013 | Las Cruces, NM

- Collecting and analyzing deep, wide-field optical images of galaxies to search for faint features indicative of galaxy mergers and young star formation as Principal Investigator of two observing campaigns.
- Prepared laboratory equipment, led weekly meetings to plan exercises, and taught undergraduate labs as teaching assistant.

UNIVERSITY OF CHICAGO | BA, with Honors, Physics with a specialization in Astrophysics

May 2007 | Chicago, IL

COMPUTING SKILLS

PROGRAMMING LANGUAGES

Experienced:
Python: pandas, matplotlib, scikit-learn
R: caret, ggplot, parallel, knitr
Familiar:
C • Fortran • LaTeX• d3.js • HTML/CSS • Jekyll

TECHNOLOGIES

Basic familiarity:
OpenStack • AWS • Hadoop • S3-compatible (object) storage APIs • MapReduce framework and parallelization • SQL and NoSQL (Accumulo) databases• Apache Kafka •Apache Avro •Apache Spark • Docker

PROFESSIONAL DEVELOPMENT AND ENGAGEMENT

CONFERENCES

Tapia Celebration of Diversity in Computing, Panelist on befriending failure — Atlanta, GA | Sep 2017
PyData, Speaker on open data streams in astronomy, Diversity Committee Organizer — Seattle, WA | Jul 2017
Tapia Celebration of Diversity in Computing, Panelist on big data — Austin, TX | Sep 2016
White House Office of Science and Technology Policy Open Data Roundtable — Washington DC | Jun 2016
Supercomputing, Network Research Exhibition presenter — Austin, TX, 2015| New Orleans, LA, 2014
Partnerships for International Research and Education, Big Data and Cloud Computing Workshops
- Lecturer on NASA satellite data analysis in the cloud — University of Amsterdam | Jun 2015
- Lecturer on reproducibility and collaborative tools — University of Amsterdam | Jun 2014
Grace Hopper Celebration of Women in Computing, Target Scholar — Phoenix, AZ | Oct 2014
New Mexico Celebration of Women in Computing — Las Cruces, NM | Nov 2012

CONTINUED LEARNING EFFORTS

Summer School in Statistics for Astronomers IX — Penn State | Jun 2013
8 data science related online classes — Coursera | 2013 - 2017

HONORS AND AWARDS

20th Century Fox and PepsiCo's "Search for Hidden Figures" in STEM Contest, Winner — 2017
Murrell Award for Professional Development and Research Accomplishment — 2013
NMSU Outstanding Graduate Assistant Award (awarded twice) — 2008-2009 & 2012-2013
Pegasus Award for Excellence in Teaching — 2010

EXTRACURRICULARS AND VOLUNTEER EXPERIENCE

Member, American Astronomical Society's Committee on the Status of Women in Astronomy — Jun 2017 - present
Technical Talk Night Organizer, Pyladies — Jan 2017 - present
Mentor, New York Academy of Sciences NEXT Scholar Program — Mar 2017 - present
Editor, AASWomen's Women in Astronomy Newsletter — Aug 2016 - present
Volunteer, UChicago Alumni Schools Committee — Aug 2009 - present
Volunteer, PyData Seattle, Diversity Committee — Jul 2017
Kaggle data science competitions – 7-time participant, one top 25% placement — kaggle.com/mtpatter
Distance Runner – 17 races including 1 marathon and 6 half marathons — runningaverage.com

SELECT PUBLICATIONS

Detecting Spatial Patterns of Disease in Large Collections of Electronic Medical Records Using Neighbor-Based Bootstrapping
M.T. Patterson and R.L. Grossman
Big Data, Sep 2017, Vol. 5, No. 3

The Matsu Wheel: a reanalysis framework for Earth satellite imagery in data commons
M.T. Patterson, N. Anderson, C. Bennett, J. Bruggemann, R.L. Grossman, M. Handy, V. Ly, D.J. Mandl, S. Pederson, J. Pivarski, R. Powell, J. Spring, W. Wells, J. Xia
International Journal of Data Science and Analytics, Mar 2017, https://doi.org/10.1007/s41060-017-0052-3

The Case for Data Commons: Towards Data Science as a Service
R.L. Grossman, A. Heath, M. Murphy, M.T. Patterson, W. Wells
Computing in Science Engineering special issue: Science as a Service, Sep 2016, Vol. 18, Issue 5

An oxygen abundance gradient into the outer disc of M81
M.T. Patterson, R.A.M. Walterbos, R.C. Kennicutt, C. Chiappini, D.A. Thilker
Monthly Notices of the Royal Astronomical Society, May 2012, Volume 422, Issue 1, pages 401-419