Maria Patterson

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BIG DATA • PROJECT MANAGEMENT• PROGRAMMING• DATA ANALYSIS

EXPERIENCE

UNIVERSITY OF WASHINGTON | Research Scientist, LSST Data Management, Dept of Astronomy
Aug 2016 – present | Seattle, WA
- Technical Lead for a Python-based streaming data ecosystem for astronomical alert distribution and processing using Apache Kafka, Avro, and Spark, driving product design, writing code, and assisting with system requirements documents.
- Writing software tools and benchmarking algorithms for the Large Synoptic Survey Telescope (LSST).

UNIVERSITY OF CHICAGO | Director of the Open Science Data Cloud
Mar 2014 – Jul 2016 | Chicago, IL
- Program manager for a petabyte scale community science cloud, managing technical cloud product development, cloud service quota allocations, and training for multi-disciplinary groups of scientists.
- Technical Lead for the development of a 300 TB data distribution system for climate data under 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 and maintained an automated analytic pipeline of machine learning algorithms for cloud processing and analysis of daily acquired NASA satellite data using Python, Hadoop, Accumulo, and Storm.
- Developed computational algorithms for detecting spatial patterns in geo-coded medical records.
- Modeled data 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 SQL 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
- Principal Investigator of two observing campaigns, collecting and analyzing deep, wide-field optical images of galaxies to search for faint features indicative of galaxy mergers and young star formation.
- 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 • Jira

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 Seattle and PyData Seattle	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