Justin Ellis | Resumé

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Qualifications

Skilled scientist and researcher with expertise in problem-solving, mathematics, software development, data and statistical analysis, and data visualization. I have many years of experience in scientific computing using Python, R, C/C++, Fortran, Matlab, Linux, and Mathematica. I also have extensive research experience in data analysis theory and application, time-series analysis, technical writing and public speaking. I am a continual learner and have completed several MOOCs in Deep Learning and Machine Learning.

Experience

Physics Frontier Center Postdoctoral Fellow
West Virginia University/NC State University *September 2017–present*

- Collaborative research on timeseries analysis with NC State statistics dept.
- Construct hierarchical Bayesian mixture model for outlier analysis

Einstein Postdoctoral Fellow
Jet Propulsion Laboratory/California Institute of Technology *September 2014–September 2017*

- Chair of gravitational wave detection working group for NANOGrav
- Develop and maintain a large Python code base for pulsar timing data analysis
- Mentored graduate and undergraduate students
- Organized several data analysis workshops and schools

Graduate Research Assistant
UWM Center for Gravitational, Cosmology, and Astrophysics *July 2011–June 2014*

- Played a leading role in the development of several pulsar timing data analysis pipelines
- Developed several simulation techniques for gravitational wave sensitivity projections used in successful NSF grants

Graduate Research Assistant
WVU Department of Physics and Astronomy *August 2009–June 2011*

- Began research career in pulsar timing data analysis
- Taught and tutored for algebra and calculus based introductory physics courses

Education

University of Wisconsin Milwaukee **Milwaukee, WI**
PhD in Physics *2014*

West Virginia University **Morgantown, WV**
B.S. in Physics, (Mathematics and Astronomy minor) *2009*

Technical skills

Programming Languages (high proficiency): Python

Programming Languages (intermediate proficiency): R, C, Fortran, Matlab, SQL, HTML

Programming Languages (some proficiency): SAS, Java, Javascript, Scala

Data Science Tools: Scikit-learn, Pandas, Jupyter, Keras, Tensorflow

Professional Development

Convolutional Neural Networks
Coursera MOOC by deeplearning.ai, [Certificate], December 2017

Structuring Machine Learning Projects
Coursera MOOC by deeplearning.ai, [Certificate], September 2017

Improving Deep Neural Networks: Hyperparameter tuning, Regularization and Optimization
Coursera MOOC by deeplearning.ai, [Certificate], September 2017

Neural Networks and Deep Learning
Coursera MOOC by deeplearning.ai, [Certificate], September 2017

Machine Learning
Audited Coursera MOOC by Andrew Ng, [Code], September 2016

Recent Scientific Highlights

- Leading the development of a new data analysis suite written in Python. This code base leverages many tools and techniques from software development including unit tests, continuous integration, auto-generated documentation, and a modular object oriented design.
- Devised a new method to model non-gaussian transient features in pulsar timing data using reversible jump Markov Chain Monte-Carlo and model averaging techniques. This work is reported in my 2016 *Physical Review D* paper.
- Led the NANOGrav detection group in and extensive study of upper limits on gravitational waves due to supermassive black hole binaries. This study was the first of its kind it that it attempted to place constraints on physical parameters related to galaxy evolution and dynamics instead of just on the gravitational waves emitted. This work was part of a NASA and NRAO press release and was reported in several popular science outlets.
- Have authored or co-authored 17 peer-reviewed scientific publications.
- Have run several workshops and schools training undergraduate and graduate students in data analysis, particularly for time series analysis using Bayesian methods.
- Have given many scientific presentations at astronomy and physics conferences and invited lectures at various universities.

References: available upon request