Bryan Brzycki

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EDUCATION

University of California: Berkeley — Berkeley, CA
August 2018 – Present
- Ph.D. Student, Astronomy
- Relevant Coursework: Designing, Visualizing, and Understanding Deep Neural Networks

Harvard University — Cambridge, MA
August 2018 – May 2018
- A.B. in Astrophysics and Physics, *cum laude* in field. GPA: 3.75/4.00
- Scored 41 on the 2016 Putnam Competition

Troy High School — Fullerton, CA
August 2010 – May 2014
- Valedictorian. GPA: 4.82/5 (Weighted)
- Qualified for USAMO twice, placed within the top 40 the second time
- Honorable Mention at the International Olympiad on Astronomy and Astrophysics (IOAA)

RESEARCH EXPERIENCE

UC Berkeley Astronomy Department / Breakthrough Listen — Berkeley, CA
Graduate Student Researcher — *June 2018 – Present*
- Using convolutional neural networks (CNNs) to search for technosignatures in spectrograms of radio telescope observations
- Wrote *setigen*, a Python package for creating synthetic radio signals with custom morphologies for use as training data for a machine learning classifier (github.com/bbrzycki/setigen)
- Developed analysis pipelines that search telescope observations for potential signals and classify them
- Working on developing a novel pipeline inspired by object detection algorithms to identify, localize, and classify signal paths within spectrogram images that are inherently noisy

Harvard-Smithsonian Center for Astrophysics — Cambridge, MA
Student Researcher — *September 2017 – Present*
- Quantified the energy stored in magnetic fields and turbulent gas motions in galaxy cluster collisions using a set of 18 fluid dynamics simulations on a computing cluster
- Organized my code as a Python package (*magnolia*), used for both scientific analysis and creation of publication-ready figures
- Presented research as my senior thesis project; currently writing paper for submission to an astrophysics journal

Maria Mitchell Observatory REU — Nantucket, MA
Research Intern — *June 2017 – January 2018*
- Used fluid dynamics simulations and Python-based libraries to investigate the evolution of gas surrounding spiral galaxies
- Developed synthetic observational data products similar to those produced from actual observations
- Worked with the Blue Waters supercomputer to run simulations and run subsequent analysis via parallel processing
- Presented poster on research at the 231st AAS meeting in January 2018

INDEPENDENT PROJECTS

Cuckoo CL — *December 2018 – Present*
Command-line interface (CLI) and web application for tracking command line jobs and notifying upon completion or error
- Writing a serverless web app connected to a CLI to enable real-time notifications on job completion for anything run in the shell
- Hosting serverless backend on AWS, using a range of services including Cognito, Lambda, DynamoDB, SNS, and SES
- Using ReactJS and MobX to power the frontend website, and planning to use React Native for a mobile app

Blossom (github.com/blossom-evolution/blossom) — *February 2018 – Present*
A Python package for simulating the evolution of organism populations
- Developed from the start with a focus on ease-of-use, user customization, and clear documentation
- Open-source with Travis CI to enable seamless continuous improvement and package expansions for additional functionality

MotivateMeBot (github.com/bbrzycki/motivate-me-bot) — *October 2018 – Present*
A Twitter bot that tries to makes motivational posts by combining photos and quotes from other tweets
- Utilized Twitter API to search for relevant tweets and images and post new, combined images
- Used Pillow for image processing; combining image blur with background color analysis to format text as legibly as possible
- Hosted the bot on Heroku, using service workers to post an image twice every day automatically

SKILLS & INTERESTS

Languages: proficient in Python; familiar with Java, JavaScript; previously used C++
Experience with Git, Travis CI, AWS, Serverless framework, ReactJS/Native, Unix/Linux, Keras/TensorFlow
Organizations: co-founded the USAAAO, dedicated to selecting and sending the USA team to the IOAA competition
Interests: music production, guitar, piano, singing, poker, fitness