ELEANOR BYLER

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ACADEMIC EXPERIENCE

Postdoctoral Research Fellow

Australian National University, Research School for Astrophysics

January 2018 – Present Canberra, Australia

- Executed large suite of gas simulations on high-performance computing cluster to predict chemical signatures of distant galaxies.
- Supervised two undergraduate student research projects.
- Served as departmental science deputy chair and managed institution-wide weekly journal discussions.

Graduate Student Researcher

University of Washington, Department of Astronomy

2011 – 2017 Seattle, WA

- Designed innovative, flexible, star formation model to improve widely-used galaxy model (800+ citations; `python-fsps`).
- Developed and maintained open-source python toolkit for running simulations and processing outputs (`cloudy-fsps`).

PROJECTS

Object detection and classification using deep learning

github.com/nell-byler/dice_detection

- Trained multi-object detection model to detect and classify images of dice.
- Implemented docker-based deployment to train model on AWS GPU EC2 instances and GCS AI Platform TPU resources.
- Augmented trained model for use on mobile devices and webcam footage.

Telescope instrument hardware metrology

University of Washington Machine Shop

- Metrology scientist for massive multi-fiber, multi-object spectrograph system with custom-designed metal fiber-optic terminators.
- Programmed SmartScope video measuring system to verify critical dimensions of imaging components prior to telescope integration.
- Developed object-oriented analysis code in python to process SmartScope outputs and flag non-compliant instrument parts.

3D Spectral Analysis in Andromeda

University of Washington

- Combined and spatially matched 3D spectroscopic data (optical, radio) and multi-band imaging data (ultraviolet, optical, infrared).
- Generated resolution-matched raster maps of different physical properties (e.g., gas temperature, chemical content), analyzed in tandem with vector data (e.g., individual stars and identified star-forming regions).

SKILLS

Data Manipulation | Image Analysis | Data Visualization | Signal Processing | Machine Learning | Computer Vision | Linear Algebra | Distributed Computing | Statistics | Unstructured data

Python | Numpy | Pandas | Scipy | Matplotlib | Git | scikit-learn | SQL | Seaborn | Linux | TensorFlow | Keras

EDUCATION

PhD in Astrophysics

University of Washington

2017

Certificates

- Machine Learning [*Coursera*]
- Deep Learning specialization: 5 course series on convolutional and recurrent neural networks [*Coursera*]

EXTRAS

Grant Writing
› Hubble Space Telescope ($169K)
› UW Research Fund ($27K)
› NSF Award ($25K)

Research Impact
› 4 publications (75 citations).
› Invited reviewer for Hubble Space Telescope time allocation committee.
› Co-lead on project design and strategy team for next-gen survey ($60M).

Communication
› Co-founder of *"Astronomy on Tap,"* Seattle's popular live science event.
› 6 invited talks and 13 contributed talks at professional conferences.
› 20+ public talks: Seattle MoPOP, Olympic National Park, Nerd Nite.