GRIFFIN S FOSTER

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SUMMARY

Researcher with over a decade experience in high-bandwidth signal processing and data analysis with a strong background in physics, computer science, statistics, and electrical engineering. Currently developing new synthetic aperture radar techniques for automotive use. Past work has focused on building FPGA-based instruments, interferometric data processing and searching for rare signal events. Author of numerous peer-reviewed journal manuscripts and a textbook on observational astronomy.

EDUCATION

2009-2013 — **University of Oxford, St. Peter's College**

PhD

Astrophysics
Thesis: *Large-N Correlator Systems for Low-Frequency Radio Astronomy*

2003-2007 — **University of California, Berkeley**

Bachelor of Arts

Physics and Astrophysics · College of Letters and Science
Double major, with a minor in Computer Science

VOCATIONAL HISTORY

Zendar

April 2019–Present — **Research Engineer**

Currently, I use a research-based approach to develop new techniques for automotive radar imaging and detection. This includes array calibration, sparse array design, practical signal-to-noise studies, MIMO, radar signal processing, 3D visualization and mixed-method back-projection imaging with synthetic aperture radar (SAR).

University of Oxford

University of California, Berkeley

Nov. 2016–Mar. 2019 — **Project Scientist**

Constructed pipelines and automated triggers for processing multi-TB per day datasets using heterogeneous systems of FPGAs, GPUs, and CPUs. Developed machine learning-based anomaly detection methods for Breakthrough Listen SETI (Search for Extraterrestrial Intelligence) and radio transient surveys.

Square Kilometre Array South Africa

July 2013–Oct. 2016 — **Square Kilometre Array Research Fellow**

Used feature detection techniques from computer vision to automate source finding and rare event detection pipelines. Radio galaxy classification using basis decomposition (shapelet, wavelet) and wide learning techniques (PCA, SVM, ensemble methods). Advisor to multiple PhD and Masters students, and taught a Masters' level course on observational radio astronomy techniques.

University of Oxford, Astrophysics

Oct. 2009–June 2013 — **DPhil Candidate and Researcher**

Led the design of FPGA-based, streaming cross-correlation instruments (ingesting $\sim$100 Gbps data rates and reduced output rates of $\sim$100 Mbps) for radio interferometric arrays in the UK and Italy. Built a python and C-based pipeline to calibrate and produce sky maps from the reduced streaming data using linear algebra and Fourier techniques.

TECHNICAL SKILLS

Mathematics

Digital Signal Processing, Linear Algebra, Statistics, Fourier Analysis, Multivariate-Calculus, Basis Set Decomposition, Discrete Mathematics

Computing Languages

Python, Matlab/Octave, SQL, C, λ, LaTeX

Analysis Techniques and Tools

Image and signal processing, Ensemble learning, PCA/SVD, Embedding and dimensionality reduction, Gaussian Processes, Fourier and basis transforms, convolutional neural networks with TensorFlow/keras, scikit-learn