Fran Bartolić

Data scientist specializing in building probabilistic statistical and machine learning models.

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location: Zagreb, Croatia

Personal Information

Nationality: Croatian

Languages: English (Fluent), Croatian (Native)

Experience

12/2022–Present Data Scientist, Salient Predictions, Remote (Contractor)

- Developing statistical and machine learning probabilistic models for sub-seasonal to seasonal weather forecasting.

09/2017–2023 PhD Research, University of St Andrews, Scotland, UK

- Authored an open-source JAX-powered Python package for the differentiable modeling of complex astrophysical problems within the realm of gravitational microlensing.
- Conducted research into Bayesian approaches for modeling astrophysical time-series data, focusing on the characterization of stars, exoplanets, and black holes in scenarios where data is sparse and interpretation is paramount.
- Completed courses in machine learning and data science.

06/2021–12/2021 Research Resident, Cervest, London, UK

- Developed a probabilistic framework for predicting temperature in urban environments utilizing both satellite and ground measurements.
- Acquired skills in remote sensing, machine learning engineering, climate science, and geospatial data analysis.

02/2020–06/2020 Research Analyst, Center for Computational Astrophysics (CCA), Flatiron Institute (Simons Foundation), New York, USA

- Created a probabilistic model for inferring time-variable two-dimensional surface maps of exoplanets from one-dimensional time series data, utilizing latent Nonnegative Matrix Factorization (NMF) and Variational Inference.
- Developed code in Python using the PyMC3, Numpyro, and JAX libraries.
- Collaborated with two other scientists in the Astronomical Data group.

Skills

Programming Python, C/C++, CUDA.

Tools JAX, PyMC, numpyro, xarray, Stan, scikit-learn, PyTorch, Jupyter, Pandas, matplotlib, R, Git, GitHub Actions, dvc, Vim, Linux.

Statistics & ML Expertise in probabilistic modelling, linear models, Gaussian Processes, spatial modeling, MCMC, variational inference, model comparison, nonconvex optimization, Frequentist statistics, and neural networks.

Geospatial Experience with building ML pipelines using Landsat, MODIS, VIIRS, and OpenStreetMap datasets.

Numerical Skilled in the automatic differentiation of complex models, numerical integration, algorithm development, and image processing.

People Skills Proven ability to work in teams in both academic and startup environments. Accomplished speaker at international conferences and public meetings, adept at conveying complex statistical methods to a non-expert audience.

Education

2017–2023 Ph.D. in Astrophysics, University of St Andrews, St Andrews, Scotland
- Probabilistic modelling of astrophysical time series : gravitational microlensing and occultation mapping of planets and moons

2015–2017 M.Sc. in Physics with Astrophysics, University of Rijeka, Rijeka, Croatia
- Cumulative GPA: 4.7/5.
- Conducted research in theoretical astrophysics at Lund University, Sweden.

2012–2015 B.Sc. in Physics, University of Split, Split, Croatia
- Cumulative GPA: 4.5/5.
- Undertook courses in theoretical physics and computer science.
- Participated in an exchange semester at Lund University, Sweden.

Interests

AI, reading, cooking, history.