

Giuseppe Barbalinardo

A computational scientist with a background in software development and extensive knowledge of modeling, statistics and machine learning.

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Skills

Technologies

- o Python (Numpy, Tensorflow, Keras, Scikit Learn, Pandas, Matplotlib, PySpark, MPI4py)
- o DB (PostgreSQL / MySQL)
- o Infrastructure (Docker / Kubernetes / Google Cloud)
- o Mobile (Objective C, Swift, Android)
- o Others (HPC / MPI / CUDA / Linux / JAVA SE)
- o Software Development (Design Patterns / Algorithms)
- o Advanced Math Tools (Statistics / Probability / Linear Algebra / Stochastic Methods)

Machine Learning and AI

- o Optimization methods
- o Dimensionality reduction using TSNE and PCA
- o Regularization using Dropouts and Penalties
- o Neural Networks: Deep, Recurrent, Convolutional
- o Clusterization Algorithms
- o NLP (Word2Vec, Transformer/BERT)
- o XGBoost, Random trees / Random forests
- o Time series analysis (ARIMA, LSTM, Wavenet)
- o Metropolis-Hastings and Markov Chain

Experience

Ph. D. Researcher – University of California, Davis

Sept '16 - Dec '20

- Lead developer and creator of [kALDo](#), a modern Tensorflow-based open-source software package for heat transport simulations, which can run on CPUs and GPUs. Development from conception to release, including unit-tests, documentation, continuous integration, and deployment using Docker and CircleCI. Implementation of Google Colab examples. Team of 5 developers. Paper published in the Journal of Applied Physics (2020). Advisor: Dr. D. Donadio.
- Development of a novel mathematical model for heat transport, which uses advanced statistical tools to reduce the computational cost of large-scale simulations. Simulations ran on HPC. Published on Nature Communication (2019).
- Application of Neural Networks to model interatomic potentials. Journal of Applied Physics (2019).
- Teaching Assistant for the graduate class of Mathematical Methods for Scientists. Numerical algorithms using Python, including: Optimization Methods (Gradient Descent, quasi-Newton, BFGS), Partial Differential Equations, Regularization, Dimensionality Reduction, Penalized Regressions, LASSO, Fast Fourier Transform, and Linear Algebra.

Software Developer and Engineering Manager – Grio, San Francisco

May '14 – Aug '16

Engineering Manager

Dec '15 - Aug '16

- Managed a team of 6-8 software developers across several simultaneous projects, while continuing hands-on coding.
- Designed and implemented the apprentice program and mentored junior developers.
- Organized the company's first hackathon.

Software Developer

May '14 – Nov '15

- Contributed to projects with diverse technology stacks, coding in Java, Objective C, SQL, and Python.
- Developed the new Target iPad app in an Agile-driven team of 12 people.
- Collaborated with the marketing and business team at Twitter. Developed an AngularJS dashboard to convert proprietary meta-language to Ruby and later application to over 10 marketing campaigns.
- Presented 4 Tech Talks at the company all-hands meeting.

Projects

Co-founder of [Ergo](#) (June 2019), an AI-powered dashboard that pulls the latest news stories across media sources and highlights relevant content to combat the spread of misinformation.

- Implementation of the main machine learning algorithms, including Sentence Transformer (SBERT), Dimensionality reduction using PCA, Entity Extraction, and Clusterization, using Python, Numpy, Tensorflow and Pytorch.
- Development of the main stack, Pytorch, Flask, Postgres, Cube, VueJS, Grafana, Docker, Kubernetes, and Google Cloud.

Education

Ph.D. Computational Chemical Physics - University of California, Davis

Sept '16 - Dec '20

Relevant coursework: Artificial Intelligence / Natural Language Processing / Computational Methods / Statistical Mechanics

M.Sc. Theoretical Physics - University of California, San Diego

Apr '12 – Dec '13

Relevant coursework: Linear Algebra / Stochastic Methods / Differential Equations / Markov Chain Monte Carlo

Awards

- Recipient of the Software Development Investment Fellowship from the NSF - Molecular Sciences Software Institute.
- Recipient of the 2020 Peter A. Rock Graduate Fellowship in Chemical Physics by UC Davis.
- Summa cum laude degree in Theoretical Physics from University of Milan.