Giuseppe Barbalinardo

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location: Berkeley, CA

Skills

Technologies

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

Machine Learning and AI

- Optimization methods
- Dimensionality reduction
- Regularization
- Neural Networks
- Clusterization Algorithms
- NLP (Sentiment Analysis, Entity extraction, Transformer/BERT)
- Time series analysis (ARMA, ARIMA, LSTM, Wavenet)

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 (Descent and BFGS), Partial Differential Equations, and Regularization, Dimensionality Reduction, Penalized Regressions, LASSO, Fast Fourier Transform, and Linear Algebra.
- Recipient of the Software Development Investment Fellowship from the National Science Foundation - Molecular Sciences Software Institute.
- Recipient of the 2020 Peter A. Rock Graduate Fellowship in Chemical Physics by UC Davis.

Software Developer and Engineering Manager – Grio, San Francisco **May '14 – Aug '16**

Engineering Manager ***Jan '16 - 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 – Aug '16***

- 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, using Postgres and Cube, VueJS, Grafana, Docker, Kubernetes, and Google App 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