### Giuseppe Barbalinardo

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location: Berkeley, CA

### *Ph. D. graduate in computational science with a professional background in software engineering and*

### *extensive knowledge of modeling, statistics, machine learning, and artificial intelligence looking for a Data Scientist role.*

### Experience

Ph. D. Researcher – University of California, Davis Sept ‘16 - Dec ‘20

* Research on predicting materials’ thermal properties from statistical ensemble and time-series analysis. Focus on novel model development and implementation to improve both **data collection** and **analytics** for large scale simulations. Collaborated with cross-functional research groups at SISSA (Italy), and the Centre of Excellence at the Aalto University (Finland), and at the Bohai University in Jinzhou (China).
* Lead developer and creator of [kALDo](https://nanotheorygroup.github.io/kaldo), a modern **Tensorflow**-based open-source software package for heat transport simulations, optimized to run **large-scale** simulations 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 tutorials. Published code paper and reference results in the Journal of Applied Physics (2020) in October 2020. Advisor: Dr. D. Donadio.
* Development of a novel model for heat in solids, which uses advanced statistical tools to reduce ~10x the computational cost of data collection and analytics of atomic **positions** and **movements**. Simulations performed on the MPS computing cluster at UC Davis. Published model and results in **Nature Communication.**
* Collaboration in the implementation of modern **Artificial Intelligence** architectures to model interatomic **forces**, reducing the simulation time by ~100x compared to full calculations, and thus allowing to **scale** to larger systems. Results published in the Journal of Applied Physics (2019).
* Teaching assistant for the graduate class of Mathematical Methods for Scientists, which teaches to students numerical algorithms using **Python,** including: optimization methods, regularization, dimensionality reduction, penalized regressions, and linear algebra.
* Recipient of the prestigious **Software Development Investment Fellowship** (~$78,000) from the National Science Foundation, Molecular Sciences Software Institute.
* Recipient of the 2020 Peter A. Rock Graduate Fellowship for the **highest academic merit** and research in Chemical Physics by UC Davis.

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 Target iPad app in an Agile-driven team of 12 people.
* Developed the Texture Next Issue app, through prototyping, validation and iterations of the product.
* 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.

### Education

University of California, Davis

Ph.D. Computational Chemical Physics, **GPA 4.0**, 2020

University of California, San Diego

M.Sc. Theoretical Physics, Condensed Matter Theory, 2013

University of Milan, Italy

M.Sc. Theoretical Physics, **Summa Cum Laude**, 2011

B.Sc. Physics, 2008

Uppsala University, Sweden

Master Thesis Dissertation, 2011

### Skills

Technologies

* Python (Numpy, Tensorflow, Keras, 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 / Information theory)

Data Science, Machine Learning and Artificial Intelligence

* Time series analysis
* Predictive modeling
* Forecasting
* Causal inference
* Optimization
* Dimensionality reduction
* Regularization
* Clusterization
* Neural Networks
* Natural Language Processing
* Markov Chain Montecarlo

### Projects

Co-founder of [Ergo](https://www.searchergo.com/) (June 2019), a **AI-NLP** driven dashboard that pulls the latest news stories across media sources and highlights relevant content in an effort to **combat the spread of misinformation.**

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

# Academic publications

* + G Barbalinardo, Z Chen, NW Lundgren, D Donadio, Journal of Applied Physics 128 (13), 135104
  + Claudia Mangold, Shunda Chen, Giuseppe Barbalinardo, Joerg Behler, Pascal Pochet, Konstantinos Termentzidis, Yang Han, Laurent Chaput, David Lacroix, Davide Donadio, Journal of Applied Physics 127
  + Leyla Isaeva, Giuseppe Barbalinardo, Davide Donadio & Stefano Baroni, Nature Communications volume 10, Article number: 3853 (2019)
  + G Barbalinardo, CA Sievers, S Chen, D Donadio, 2018 IEEE-NANO 18414617
  + M Battiato, G Barbalinardo, PM Oppeneer. Physical Review B 89 (1), 014413, - January 2014
  + M Battiato, G Barbalinardo, K Carva, PM Oppeneer. Physical Review B 85 (4), 045117 - January 2012