Angelo Monteux | Resume

THEORETICAL PARTICLE PHYSICIST, ASPIRING DATA SCIENTIST – Denver, CO

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Skills

LANGUAGES: Python, Mathematica, C/C++, Bash Shell in scientific environment. Fluent in English, Italian, French.

TOOLS: numpy, matplolib, pandas, keras, jupyter (*fluent*); git, SQL, tensorflow, scikit-learn *(some experience).*

TECHNICAL SKILLS: statistics, machine learning, advanced quantitative analytics, data analysis and visualization.

SOFT SKILLS: collaborative work, creative thinking, problem solving, planning and prioritization, communication.

Projects

Physics

- **Data mining the LHC** — ilmonteux.github.io/LHC_rectangular_aggregation

Data-mining algorithm to distinguish signal in high-dimensional datasets, such as results of experimental searches at the Large Hadron Collider (LHC). Using log-likelihood ratio test to establish statistical significance, including treatment of correlations in hundreds of data bins. Presented in the published paper arXiv:1707.05783 and at international conferences.

- **Jet tagging with neural networks** — ilmonteux.github.io/2018/10/15/jet-tagging-cnn.html

Use convolutional neural networks (CNN) with keras and tensorflow on Google's Colab to improve identification of different particles at the LHC. Contributed to paper arXiv:1803.00107.

Side projects

- **Chronomaps** — ilmonteux.github.io/chronomaps

Use Google Maps API to compute travel times from given location. Visualize fixed-time contours on map, and deform map to visualize travel time instead of distance. Visualize traffic flows.

- **Cartograms of US elections** — ilmonteux.github.io/cartograms

Mapping US election data at the state and county level. Produce cartograms, which change map area to reflect population instead of land surface. Analyze demographics trends and correlations with voting choices.

Postdoctoral Work Experience

University of California, Irvine — **Irvine, CA**
Postdoctoral researcher, UC Irvine particle theory group. — *2017–present*

Rutgers University — **New Brunswick, NJ**
Postdoctoral researcher, New High Energy Theory Center. — *2014–2017*

- Write versatile MonteCarlo simulation scripts for generating jobs to run on a HTCondor parallel cluster (1000 nodes).
- Developed framework for quick reinterpretation of LHC results in 2016, built largest LHC search database to date, including being the first and so far only group taking into account correlations in experimental searches for 2+ years.
- Participate in data science workshops, such as the 2017 school on Computational and Data Science for High Energy Physics (CoDaS-HEP) in Princeton, or Neural Networks with Python course at the UC Irvine Data Science Initiative.
- Contributed to bug reports and bug fixes in C++ tools widely used by the High Energy Physics community.
- Achieve speed-up by factor of 10 by porting Partial Differential Equation code from Mathematica to C++.
- Develop research ideas and projects from start to publication in short timescales, independently or with collaborators.

Education

Ph.D. Theoretical Particle Physics — **Santa Cruz, CA**
University of California, Santa Cruz — *2010–2014*

M.S. Theoretical Physics — **Parma, Italy**
University of Parma, Italy — *2008–2010*

B.S. Physics — **Parma, Italy**
University of Parma, Italy — *2004–2008*