Citizenship: Canadian

Boston, MA

+1 617 4601270

agrday@bu.edu

alexandreday.github.io

user:alexandreday

Google Scholar

LinkedIn

Programming

Python ★★★★★
C/C++ ★★★★★
Mathematica ★★★★★
bash/shellscript ★★★☆☆
HTML/CSS/JS ★★★☆☆
Matlab ★★★☆☆

Machine learning

Modelling ★★★★★
Statistics ★★★★★
Deep learning ★★★★☆
Scikit-learn ★★★★★
Keras ★★★★★
Tensorflow ★★★☆☆

Data visualization

Matplotlib/plotly ★★★★★
d3.js ★★★☆☆

Languages

English ★★★★★
French ★★★★★

Experience

09/14 - Now **Physics Ph.D. candidate, P. Mehta's lab** Boston University

- Successfully applied reinforcement learning (RL) methods to controlling quantum states (corresponding paper has 20+ citations).
- Contributed to a machine learning review for physicists (~ 120 pages).
- Using RL to accelerate Markov Chain Monte Carlo methods.
- Demonstrated the strengths of using dimensional reduction methods to study glass transitions.

01/16 - Now **Collaboration, G. Altan-Bonnet's lab** National Institute of Health

- Developed **HAL** (Hierarchical Agglomerative Learning), an end-to-end pipeline to perform *interpretable* and *robust* clustering of high-dimensional single-cell data.
- Application of HAL for Flow cytometry and CyTOF ($\sim 10^6$ data points/sample) data and for immunology and clinical research at NIH.
- Achieved state-of-the-art *clustering* on the MNIST dataset (score $> 85\%$)

01/13 - 08/13 **M.Sc. in Physics, M. Gingras's lab** University of Waterloo
Analytical modelling of quantum models representing complicated magnets.

Education

09/14 - 12/18 **Ph.D. in Physics** Boston University
Application of ML to statistical physics and biophysics problems

01/13 - 08/14 **M.Sc. in Physics** University of Waterloo, Canada
Modelling and numerically simulating complex quantum magnets

09/09 - 12/12 **B.Sc. in Physics** University of Sherbrooke, Canada
Internships: numerical simulation of superconductors and quantum magnets

Publications

Co-authored 10+ publications with 200+ citations, with h-index of 6.

Selected publications:

- *Reinforcement Learning in Different Phases of Quantum Control*
  M. Bukov, A. Day, *et al.*, **arXiv:1705.00565**
- *A high-bias, low-variance introduction to Machine Learning for physicists*
  P. Mehta, M. Bukov, CH Wang, A. Day, *et al.*,**arXiv:1803.08823**

Honors & Awards

09/14 - 09/17 **NSERC Postgraduate scholarship D (63000$)** Boston University

09/14 - 09/15 **Boston University Dean's fellow (5000$)** Boston University

01/13 - 08/14 **NSERC Alexander-Graham-Bell Scholarship (17500$)** University of Waterloo