Andrew Spott

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Broadly skilled Physics PhD seeking a change of career into Machine Learning and Artificial Intelligence. I have a strong quantitative background, with specific expertise in high performance computing, numerical methods and data analysis.

Education

2010–2017 **University of Colorado Boulder**, *School of Arts and Sciences.*

- **Ph.D.** Physics, *Perturbative and ab-initio calculations of the electrical susceptibilities of atoms*
- **Masters of Science** Physics, 2013

2004–2010 **University of Washington**, *School of Arts and Sciences.*

- **Bachelor of Science** Physics.

Relevant Experience

2011–2017 **Research Assistant**, *University of Colorado Boulder.*

- **Programming:** Developed a non-trivial code to solve the time dependent Schrödinger equation (TDSE) in a field-free energy basis. The code was developed using PETSc and Boost MPI in C++14, with an approximate size of 10kloc. *https://github.com/spott/ebss*
- **Data Analysis:** Data analysis package for the above TDSE solver output. Developed using pandas, numpy, scipy and matplotlib. Package available at *https://github.com/spott/python_da_lib/*

2015 **Data Science Intern**, *Cognilytics, Centurylink*, Denver.

- **Data Science:** Preliminary analysis of anomalous network traffic for network security applications using raw packet captures with support vector machines, recurrent neural nets and random forests.

2010–2017 **Teaching Assistant**, *University of Colorado Boulder.*
Taught a wide variety of introductory physics classes. Demonstrated a strong ability to take complex mathematical concepts and explain them intuitively.

Side Projects

petsc-cpp *https://github.com/spott/petsc-cpp*

- An object oriented wrapper around PETSc for faster and safer PETSc development. The wrapper includes RAII types, operator overloading where it makes sense, and simpler interfaces to common tasks.

webpage-classifier *https://github.com/spott/webpage-classifier*

- A topic classifier for webpages, developed in a literate style using reddit link posts as a labeled data source. Uses SQL, Docker, asyncio, and Latent Dirichlet Analysis via gensim among other technologies.

Skills

Data Analysis: NumPy, SciPy, pandas, matplotlib
Main Languages: Python, C/C++/C++14
Other Languages: Haskell, Clojure, R, Mathematica, SQL
Tools: git
Markup: LaTeX, BibTeX, Markdown

Selected Publications

Phys. Rev. A 2014 *Ab initio and perturbative calculations of the electric susceptibility of atomic hydrogen*
A. Spott, A. Jaron-Becker, and A. Becker

Phys. Rev. A 2015 *Transition from perturbative to nonperturbative interaction in low-order-harmonic generation*
A. Spott, A. Becker, and A. Jaron-Becker

Phys. Rev. A in review *Time-dependent susceptibility of helium atom in intense laser pulses*
A. Spott, A. Jaron-Becker, and A. Becker