

# Andrew Spott

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📄 [spott.github.io](https://spott.github.io)

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/](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

**Tools:** git

**Markup:** L<sup>A</sup>T<sub>E</sub>X, B<sub>I</sub>B<sub>T</sub>E<sub>X</sub>, Markdown

## Selected Publications

- Phys. Rev. A *Ab initio and perturbative calculations of the electric susceptibility of atomic hydrogen*  
2014 **A. Spott**, A. Jaron-Becker, and A. Becker
- Phys. Rev. A *Transition from perturbative to nonperturbative interaction in low-order-harmonic generation*  
2015 **A. Spott**, A. Becker, and A. Jaron-Becker
- Phys. Rev. A *Time-dependent susceptibility of helium atom in intense laser pulses*  
in review **A. Spott**, A. Jaron-Becker, and A. Becker