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Alan WILSON

Education

2011 **Ph.D. (Experimental Particle) Physics**, *University of Michigan*, Ann Arbor.

2003 **M.S. Mathematics**, *University of Michigan*, Ann Arbor.

1999 **B.S. Computer Engineering & Mathematical Sciences (dual degree)**, *University of Washington*, Seattle.

Proficiencies & technical interests

Almost every day

- Python, C++, ROOT, cint
- git, svn, etc.
- numpy+scipy+matplotlib
- iPython notebook
- Standard linux tools, LaTeX, VMs
- Cluster and cloud computing

Occasionally

- SQLlite and MySQL, AWS
- Statistical modeling
- Machine learning, boosted decision trees
- Linux admin., shell scripting
- HTML, CSS, javascript, jQuery

Dabble in

- D3, nltk, web scraping, Hadoop
- Mathematica, Matlab, Octave
- Perl, Lisp dialects
- (Social) network analysis
- Coding and compression theory

Experience

2014–present **Fellow at Insight Data Science**, Mountain View, CA.

- Developed the web app NewsSpectra.com which presents alternative coverage of a topic on a spectrum of readability.
- Scraped and extracted information from Google News and individual sources with scrapy, BeautifulSoup, and goose.
- Used Python tools nltk and scikit-learn to tokenize, cluster, and rank articles by Flesch-Kincaid reading level.
- Published application using AWS, MySQL, gunicorn, supervisor, Bootstrap, and D3.

2011–2013 **Post Doctoral Research Fellow**, *ATLAS Experiment*, Geneva, Switzerland.

- Filtered massive datasets ($>$ 1 TB) to find very rare signals using local and world-wide batch computing, contributing to the discovery of the Higgs boson.
- Built C++ applications on top of the shared tools of a collaboration of 2000 scientists to calibrate, resolve ambiguities, and filter data.
- Developed a framework in Python and ROOT for specifying, building, and publishing plots to the web.
- Applied unit tests to publications by factoring out numerical quantities in JSON/YAML+Python.
- Controlled and monitored data acquisition, requiring quick reactions and efficient communication with colleagues.

2005–2010 **Graduate Student Research Assistant**, *ATLAS & DØ Experiments*, Michigan & Illinois.

- Used a large stack of Monte Carlo simulations (from particle production to detector response), as well as extrapolations from data, to quantify signal and background.
- Increased signal to background separation in selection and identification problems using boosted decision trees.
- Computed 95% confidence intervals for new physical parameters using likelihoods built from data and statistical models of signal and background (with many nuisance parameters quantifying uncertainty).
- Managed Monte Carlo simulations by translating colleagues' informal requests into formal job specifications, testing and submitting the jobs, and monitoring the results; built tools in Python to streamline all of these steps.
- Contributed 100+ pages to documents describing the experiment's sensitivity to new physics.

2004–2005 **Research Assistant**, *ATLAS Experiment*, Univ. of Michigan, Geneva, Switzerland.

- Validated software by broadly and systematically comparing alternative systems for unexpected discrepancies; found and reported on important bugs.
- Led a team of five students to complete assembly and testing of large detector components.

1999–2004 **Misc. Teaching**.

- Univ. of Michigan Math Dept.: taught Precalculus, Calculus I and Calculus II, and assisted with Differential Equations.
- Univ. of Washington CSE Dept.: assisted with Discrete Math, Computer Graphics, and Digital Design.