Benjamin Tannenwald

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Experience

Graduate Research Associate — Columbus, OH/Geneva, CH

Ohio State University/CERN *2013 - 2017*

- Produced precise measurements of the interactions of fundamental particles and searched for new signatures of the Higgs boson with petabyte scale datasets collected at the CERN Large Hadron Collider
- Designed distributed computing algorithms to sift through terabytes of physics data, categorize events based on significant criteria, and optimize reconstruction of subatomic interactions using combinatorical likelihoods
- Created data-driven methods for modeling background processes in searches for novel experimental signatures
- Modeled uncertainty in complex multivariate processes using various statistical techniques in order to understand significance of observed results
- Developed C++ software frameworks used by physicists at 6 collaborating international and American institutions
- Used industrial machinery control software to design and commission user interfaces for experimental devices
  - Tested and installed sensitive silicon and diamond-based pixel detectors
  - Used WinCC to create data structures and interface for efficient detector monitoring and operation
- Developed and maintained Condor computing cluster used for simulation and data analysis
- Worked in small (2-4 people) and larger (10-20 people) analysis groups spread across multiple time zones in supporting and leadership roles coordinating workflow and collaborating on multiple projects
- Presented analysis work and results to research groups inside the collaboration and to larger audiences at international scientific conferences

Graduate Teaching Associate — Columbus, OH

Ohio State University *2011 - 2013*

- Taught undergraduate holography, lab courses, and general physics classes covering kinematics, electromagnetism, nuclear physics, and thermodynamics (each 20-30 students)
- Received Hazel Brown Outstanding Teaching Assistant Award in 2012

Independent Projects

Columbus Political Campaign Finance *2017*

- Used Python with scrapy, BeautifulSoup, numpy, and matplotlib to scrape city government databases for municipal campaign finance information in Columbus, OH, create database for querying scraped data, and identify patterns in campaign activity and fundraising

Franklin County Voter Prediction *2017*

- Predicted voting behavior in the November 2017 general election using publicly available Franklin County, OH voting records. Used Python with scipy, numpy, and matplotlib to design data structures, identify significant voting history patterns, create prediction models using regression techniques, and identify precincts with large numbers of likely voters

Education

Ph.D. in experimental particle physics, Ohio State University, Columbus, OH *2017*
M.Sc. in physics, Ohio State University, Columbus, OH *2013*
B.S. in physics, University of Kansas, Lawrence, KS *2011*
B.A. in mathematics and anthropology, University of Kansas, Lawrence, KS *2011*

Skills

- Computing languages: C++, Python, shell scripting, LaTeX, WinCC, Mathematica
- Tools: Scrapy, BeautifulSoup, Numpy, Scipy, Matplotlib, Git, Condor
- Languages: English (native), French (fluent)