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James R. Verbus

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EXPERIENCE

Insight Data Science Fellow **Sept. 2016 - Present**
Insight Data Science, Palo Alto, CA

- Created a compromised user account detection system while providing data science consultation services for Castle.io, a YC W16 startup (link to blog post)
- Developed a statistical model for unsupervised anomalous event detection resulting in a >2× improvement in the recall of compromised accounts over the existing model with the same false positive rate

Postdoctoral Researcher / Graduate Research Assistant **Sept. 2009 - Aug. 2016**
LUX/LZ Dark Matter Experiments, Brown University, Providence, RI

- Pioneered the use of SciDB—a parallel, array-based database with built in analytics—in the cloud using Amazon Web Services (EC2 and S3) for interactive analysis on TB-scale datasets
- Managed a team of scientists and engineers as a calibration group leader with supervision over a $369k budget
- Led the experimental design, operations, and data analysis effort for a novel, world-leading calibration of the LUX dark matter detector:
  - Defined and executed a complex operations, data acquisition, and analysis plan in a collaborative environment
  - Created Monte Carlo simulations to predict expected experimental effects and compared the results of these models to measured data
  - Engineered features for event classification within a 100+ dimension parameter space
  - Applied maximum-likelihood-based statistical techniques to measure multiple parameters of interest using a complex ∼1 TB dataset
- Deployed and operated the Python-based data processing framework on an 8,000 core high-performance computing cluster processing up to 900 GB/day of incoming data
- Administered the LUX primary data repository serving 0.5 PB to 100+ collaborators
- Developed Matlab and Python algorithms for the characterization of features with a timescale of 10 ns to 300 μs in time series data
- Managed the LUX data processing working group while scaling up the production data pipeline
- Led development of the Python-based data processing framework supporting Python, Matlab, and C++/ROOT algorithm modules
- Directed various teams during 307 days of on-site presence during the integration and operation of the LUX experiment 4,850 ft underground at Sanford Laboratory in Lead, SD

TECHNICAL SKILLS

Machine Learning: classification, regression, clustering, feature engineering
Statistical Methods: data visualization, experimental design, hypothesis tests and confidence intervals, Monte Carlo simulation, maximum-likelihood
Software Tools: MATLAB, Python, scikit-learn, Pandas, NumPy, SQL, git, SVN, Jupyter notebooks, bash, LaTeX, UNIX
Selected Coursework: Pattern Recognition and Machine Learning, Scientific Programming in C++, Digital Signal Processing, Computational Methods in Physics

EDUCATION

Ph.D. Experimental Particle Astrophysics **May 2016**
Sc.M. Physics **May 2010**
Brown University, Providence, RI

B.S. Physics, Magna Cum Laude **May 2009**
Case Western Reserve University, Cleveland, OH

PUBLICATIONS AND TALKS

Publications: 10+ publications, 1900+ citations (full list: inspirehep.net/author/profile/James.R.Verbus.1)
Public Speaking: 11 public scientific talks (seven of which were invited)