

# Ivan Pogrebnyak

Data Scientist

PhD in High Energy Physics

✉ ivanp@msu.edu  
☎ (919) 215-5546  
👤 ivankp.github.io  
🏠 Garner, NC



## 📁 EXPERIENCE

Over 10 years of experience with statistical analysis and data science techniques obtained from working in experimental particle physics.

**Higgs boson data analysis at CERN Large Hadron Collider** Jun 2013 – May 2021

- Analyzed terabytes of experimental and simulated data.
- Developed interactive web-based analysis tools eliminating the need to manually perform recurring data categorization tasks.
- Implemented and applied (non-)linear statistical regression models.
- Optimization and significance testing; LLR, Wald and F tests.
- Uncertainty analysis using complex constrained likelihood models.
- Monte Carlo simulations.

**DOE Science Graduate Student Research (SCGSR) fellowship** Jan 2015 – Dec 2015

- Delivered requirements for improvement of an electronics monitoring system crucial for continued operation of the ATLAS experiment.

**Statistical analysis of nuclear data at UNC** May 2012 – May 2013

- Non-linear regression modeling.
- Model optimization using likelihood and  $\chi^2$  methods.


## 📁 TECHNOLOGY SKILLS


- C++, C, CERN ROOT  
Application and implementation of data analysis tools, system programming, expert knowledge of modern C++, including C++20
- Python: `scikit-learn`, `numpy`, `matplotlib`, `requests`  
Data mining, data analysis, data visualization, and general scripting
- Javascript, HTML, SVG, CSS, PHP, `http`, `websockets`  
JS tools: `jQuery`, `d3.js`, `Highcharts`, `Plotly`  
Web development, frontend and backend
- SQL, `sqlite`  
Database management, data aggregation
- Git, GitHub, GitLab, SVN  
Software version control and collaboration
- GNU+Linux OS and utilities
- Other: Java, Mathematica, VHDL, Xilinx ISE, Geant4.

## ✂ GENERAL SKILLS



- Collaboration: worked in small (1–5 people) and large (10–50 people) analysis groups.
- Written communication: directly contributed to 17 published articles and reports.
- Verbal communication: gave over 50 presentations at meetings at different levels of collaboration.
- Initiative and creativity: learned web development, server programming, and database operation on my own to simplify, automate, visualize, and share data analysis algorithms and results.
- Supervision and mentoring: trained undergraduate and graduate students entering the group in programming and physics to bring them up to speed for doing research.
- Project and time management: always met deadlines for concurrent projects in time for conferences.

## 🎓 EDUCATION

2013 – 2021  
 Michigan State University  
**PhD**, High Energy Physics

2009 – 2013  
 University of North Carolina at Chapel Hill  
**BS** with Honors, Physics  
**BA**, Mathematics

## 👥 AFFILIATION

  2013 – 2021  
CERN  
Large Hadron Collider  
ATLAS Experiment

## 📊 DATA SCIENCE SKILLS

- Data mining
- Regression modeling
- Hypothesis testing
- Machine learning
- Multivariate analysis
- Uncertainty analysis
- Optimization algorithms
- Big data
- Distributed computing
- Monte Carlo simulations
- Gaussian processes
- Data visualization
- Interpretation and presentation

## 💬 LANGUAGE FLUENCY

English, Russian, Ukrainian