

# Othmane Rifki, Ph.D.

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## Summary

Data scientist and physicist with **8 years experience** in advanced statistical analyses of large datasets ( $\sim 50$  PB) of proton collisions recorded at CERN and processed with world-wide distributed computing systems (grid and cloud).

Led several **cross-functional** analysis teams with weekly deadlines and quarterly scientific publications searching for rare signal processes of new physics among large backgrounds (rate  $\sim 10^{-9}$ ), employing numerous optimization and regression modeling techniques, leveraging **machine learning** algorithms and **deep learning** frameworks.

Developed the main data analysis software framework (for 50+ people) relying upon **version control** and **issue tracking** tools. Deployed **online filtering** algorithms for on-the-fly selection of proton collision data. Maintained monitoring and validation tools for detector performance and data quality using **anomaly detection** algorithms and **time series** analysis.

## Skills

- 🎯 **Languages:** Analyzed and visualized high-value datasets with software packages developed in multiple languages
  - Core languages: Python, C/C++/STL (10+ years)
  - General software: Linux, bash, git, svn, Jira, QT, Matlab, Mathematica (10+ years)
  - Data science software: matplotlib, numpy, scipy, scikit-learn, pandas, Keras, TensorFlow, OpenCV (3+ years)
- 🎯 **Leadership:** Led several scientific groups to achieve time-critical targets
  - Managed teams of **5-20 researchers** leading to several **peer-reviewed** journal publications
  - Supervised **PhD and Master students** with successful thesis defenses
  - Organized and chaired weekly meetings and delegated tasks with emphasis on individual strengths
- 🎯 **Publication and Communication:** Excelled in written and verbal communication skills
  - Published **15 scientific papers** in peer-reviewed particle physics and instrumentation journals ([complete list](#))
  - Presented the latest scientific advancements at **notable international conferences** with 500+ attendees
  - Summarized research and data analysis to non-technical audiences at various **outreach activities** ([briefing](#))
  - **Fluent** in English, French, Arabic with basic skills in German

## Experience

- 🎯 **[European Organization for Nuclear Research \(CERN\)](#)** **Geneva, Switzerland**  
*Post-Doctoral Research Fellow, Associate Member* *Aug 2016 - Present*
  - Performed likelihood-based statistical analyses on a petabyte-scale dataset, using predictive modeling algorithms
  - Automated pick-and-place assembly with robotics and advanced optics to achieve **micron level precision** ([demo](#))
  - Achieved **high accuracy pattern matching** using computer vision algorithms in challenging conditions
  - Administered a laboratory budget of **300k Euros** coordinating a team of scientists, engineers, and suppliers
  - Supervised a team of 10 scientists to ensure high-quality data recorded by the ATLAS detector
- 🎯 **[Argonne National Laboratory \(ANL\) & OU](#)** **Lemont, IL, United States**  
*Research Fellow* *Aug 2012 - Jul 2016*
  - Won \$30k Analysis Support Center Fellowship awarded to one student a year to work with ANL scientists
  - Simulated complex particles production and interaction using the **IBM Mira supercomputer**
  - Designed **real-time data processing** algorithms with strict real-time performance to process 160 gigabytes/second

## Education

- 🎯 **University of Oklahoma (OU)** *Ph.D. in High Energy Physics* **Norman, OK, United States**
- 🎯 **Drexel University** *B.Sc. in Physics with High Honors* **Philadelphia, PA, United States**

## Activities

- 🎯 **Triathlon:** Competing in the Hamburg Landesliga in the 2018 and 2019 seasons
- 🎯 **Diving:** CMAS 3 star diver with TDI advanced nitrox certification