Othmane Rifki, Ph.D.

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Summary

Principal applied scientist and physicist with **8 years experience** at **CERN** in solving complex problems with **scientific rigor** and currently helping make the internet safer by targetting and flagging toxic content in real-time. Performed advanced statistical analysis of **datasets of hundreds of petabytes** collected from 100 million sensors and processed with worldwide **distributed cloud computing**. Applied **optimization** and **machine learning** techniques to high-dimensional datasets. Maintained **monitoring tools** of data quality using **anomaly detection** and **time series** analysis.

Experience

Spectrum Labs — **Boston, MA**
Principal Applied Scientist — *Sep 2020 - Present*

- Design algorithms to perform real-time analysis of audio signals to detect toxic content using state-of-the-art machine learning algorithms to achieve over 90% accuracy
- Brought rigorous sequence modeling and pattern finding solutions to detect toxic behaviors very accurately

Conseil Européen pour la Recherche Nucléaire (CERN) — **Geneva, Switzerland**
Deutsches Elektronen-Synchrotron (DESY) — **Hamburg, Germany**
Post-Doctoral Research Fellow, Associate Member — *Jul 2015 - Sep 2020*

- Helped refute one of the most promising hypotheses on the nature of dark matter (85% of the mass of the universe), by analyzing 10 million billion proton collisions of **complex and high dimensional data**
- Narrowed the search for new particles of supersymmetry by 50% via likelihood-based statistical analyses on petabyte-scale dataset using **predictive modeling algorithms**
- Built **economical** micron-level precision pick-and-place assembly unit using computer vision algorithms to build the next-generation multi-million dollar particle detector; see here a video of the machine at work

Argonne National Laboratory (ANL) — **Chicago, United States**
Research Fellow — *May 2014 - Jul 2015*

- Used **IBM Mira supercomputer** to generate Monte Carlo simulation of millions of complex particles interaction leading to a 1000x speed-up and results used by hundreds of data analyses
- Developed a **real-time filtering** system to process 160 GBPS enabling 3000+ scientists to analyze 20% more proton collision data 400x more efficiently
- Won $30k Analysis Support Center Fellowship awarded to one student a year to work with ANL scientists

Skills

Software: Analyzed and visualized high-value datasets

- **Languages** (10+ years): Python, C/C++/STL
- **Data science** (5+ years): SQL, Numpy, Scipy, Pandas, Keras, Scikit-learn, PyTorch, TensorFlow, OpenCV, Matplotlib
- **General** (5+ years): Matlab, Mathematica, Linux, Bash Scripting, Git, Jira

Leadership: Led several **cross-functional** teams with regular deadlines and quarterly publications

- Organized and chaired regular meetings and delegated tasks with emphasis on individual strengths
- Managed teams of **5-20 researchers** to develop analysis, forecasting, and optimization methods
- Supervised **10 graduate students** with successful thesis defenses

Publication and Presentation: Excelled in verbal and written communication

- Presented findings for stakeholders through **visual displays of quantitative information**
- Authored **complex research work** for specialists and general audience; see an example and the complete list
- **Fluent** in English, French, Arabic with basic skills in German

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**