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Yuriy Volkotrub

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Highly motivated Data Scientist with a strong background in Nuclear/Particle Physics, specializing in data analysis, statistical modeling, and machine learning. Extensive experience with the ATLAS experiment the Large Hadron Collider (LHC) at the European Organization for Nuclear Research (CERN), proficient in Python, C++, and various data analysis tools. Proven ability to process and analyze complex datasets, develop automation scripts, and perform advanced statistical analyses.

Experience

Research Experience

Nov. 2023 **Postodoctoral Researcher/Data Analyst**, *Jagiellonian University*, Kraków, Poland, ATLAS Experiment @ CERN.

- Analyzed data to search for light resonances from Higgs decays in high-energy physics.
- Developed automation scripts in Python and Bash.
- Conducted simulation and trigger studies for long-lived particle searches.
- Performed data analysis using Python, C++, and ROOT.
- Developed C++ code for background measurement in Higgs decays.
- Processed experimental measurement data.
- Experience working agile with Git, CI/CD.

Oct. 2021 – Oct. 2023 **Postodoctoral Researcher/Data Analyst**, *AGH University of Kraków*, Kraków, Poland.

Engaged in pioneering research in nuclear physics (heavy-ion physics) through active participation in the prestigious ATLAS Collaboration at CERN, Switzerland:

- Validated data processing from experimental measurements.
- Reconstructed and calibrated physics objects, optimized ATLAS detector for heavy-ion physics.
- Developed C++ code for background measurement in top-quark pair production in proton-lead collisions.
- Performed data analysis using Python, C++, and ROOT.
- Generated Monte Carlo events and automated data processing scripts.
- Performed advanced statistical analysis on combination of the ATLAS and CMS results under the STRONG-2020 project.
- Analysis support in validation of data processing from experimental measurements

Jun. 2021 – Sept. 2021 **Scientific Researcher/BAND Summer Fellowship**, *BAND Collaboration*, USA.

The project involved remote collaboration with four institutions across the USA to pursue an accurate description of the properties of atomic nuclei and collisions between nuclei:

- Collaborated remotely with US institutions to improve nuclear physics models.
- Tested emulation and calibration tools for uncertainty quantification parameters.
- Automated interfaces between surrogate models and calibration techniques.

2016 – 2021 **Scientific Researcher (Junior Associate)**, *Jagiellonian University*, Kraków, Poland.

- Handled experimental nuclear physics data.
- Conducted data analysis and visualization using various statistical models.
- Developed numerical simulations and published scientific papers.
- Gained knowledge in data science and machine learning.

Teaching Experience

Summer semester 2023 **Teaching Assistant**, *AGH University of Kraków*, Kraków, Poland.

- Tutor of exercise classes in Data Analysis for students in Technical Physics of the second cycle.

2017 – 2019 **Teaching Assistant**, *Jagiellonian University*, Kraków, Poland.

- Led laboratory classes in Nuclear Physics for "Advanced Materials and Nanotechnologies" students every summer semester.
- Developed statistical web applets (in Javascript) and conducted exercise classes in Probability and Statistics for students of the second year of computer science.
- Led Physics laboratory classes for schoolchildren.

Skills

Programming	Confident in *Mathematica*, C++, Python (NumPy, SciPy, Seaborn, Pandas, Matplotlib, Sklearn, PyTorch, TensorFlow etc.), SQL, Excel, JavaScript (basics), `GEANT4` (basics)
Tools/Software	ROOT, Mathematica®, Jupyter Notebook, Bash, Gnuplot, LaTeX, Vim
Computer/Technical	Git and version control, VS Code, Jira, Confluence, Linux (Debian, Mint), Docker, ssh etc.
Laboratory equipment	Multimeters, oscilloscopes, spectrum analyzers
General	Data visualization and manipulation
Other	Strong mathematics and statistics background

Languages

English and Polish (Upper-Intermediate), Russian (Fluent), Ukrainian (Native)

Professional Interests

Research Statistics and Machine Learning, Quantative Analysis, Data Science, numerical simulations, Calculus, AI, problem solving, nuclear physics

Education

Oct. 2016 – Sept. 2021 **Doctor of Philosophy in Physics**, Jagiellonian University, Kraków.

Sept. 2015 – Jun. 2016 **Erasmus Mundus exchange program for master students**, *Jagiellonian University*, Kraków, Poland.
Full time graduate study in the field of physics and astronomy.

Sept. 2014 – Jun. 2016 **Master of Science in Physics of nucleus and high energies**, ONPU, Odesa.
with honours

Sept. 2010 – Jun. 2014 **Bachelor of Science in Physics**, ONPU, Odesa.
with honours

Selected courses

- Introduction to Data Science
- Time Series Analysis

Interests

- Mountaineering
- Solving mathematical problems and coding
- Mushroom hunting
- History
- Music

Online-Courses

- Python, Kaggle
- Data Visualization, Data Analysis, Data Analysis, Machine Learning using Python, IBM/Coursera
- Python Programmer Track, Data Scientist with Python, DataCamp