Yuriy Volkotrub

Curriculum vitæ

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Young researcher with extensive scientific experience gained in a recognized high-energy physics experiment. I am experimental particle physicist (PhD in theoretical nuclear physics) with an extensive experience in data analysis: selection optimization, statistical interpretation; models building (utilizing also Monte Carlo methods) and validation. In addition to practical experience, excellent data analysis skills are evident, particularly in the programming languages Python/C++ and ROOT.

Experience

Research Experience

March 2023 – present — **Member of the ATLAS Collaboration**, *AGH University of Kraków*, Kraków, Poland.
- Analysis support in validation of data processing from experimental measurements
- The total of 1 month at CERN.

Oct. 2021 – Oct. 2023 — **Assistant Professor (Postodoctoral Researcher)**, *AGH University of Kraków*, Kraków, Poland.

Engaged in pioneering research in nuclear physics through active participation in the prestigious ATLAS Collaboration at CERN, Switzerland:
- Reconstructing and calibrating physics objects, optimization of optimization of electromagnetic part of ATLAS detector for heavy-ion physics
- Conducted data analysis, developed automation scripts (Python, Bash), and authored C++ code for background measurement in the production of top-quark pairs in proton-lead collisions
- Data analysis (Python/C++, ROOT)
- Monte Carlo event generation
- Performed advanced statistical analysist on combination of the ATLAS and CMS results under the STRONG-2020 project

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:
- Conducted testing on innovative emulation and calibration tools to address the challenge of uncertainty quantification parameters used theoretical nuclear physics tasks. Emphasis was placed on automating the interface between surrogate models, also known as emulators and calibration techniques.

2016 – 2021 — **Scientific Researcher (Junior Associate)**, *Dpt. of Theory of Nuclear Systems, Jagiellonian University*, Kraków, Poland.

Application of the newest theoretical models of the nuclear force, with particular attention to low-energy nuclear physics problems:
- Utilized statistical tools to investigate the impact of various theoretical uncertainties, encompassing Bayesian parameter estimation and correlation analysis.
- Developed programs/automation scripts (Python, Bash), performed calculations (Mathematica®).

Teaching Experience

Summer semester 2023 — **Teaching Assistant**, *AGH UST*, Kraków, Poland.
- Tutor of exercise classes in Data Analysis for students in Technical Physics of the second cycle, AGH UST.

2017 – 2019 — **Teaching Assistant**, *Jagiellonian University*, Kraków, Poland.
- Tutored weekly laboratory classes for "Advanced Materials and Nanotechnologies" students each summer semester.
- Prepared statistical web applets for students' practice (in Javascript).
- Led Physics laboratory classes for schoolchildren.
- Conducted "Probability and Statistics" course for students of the second year of computer science.

Skills

Programming	Confident in *Mathematica*, ROOT, C++, Python (NumPy, SciPy, Seaborn, Pandas, Matplotlib, Scikit-learn etc.), Fortran, SQL, JavaScript (basics), PySpark (basics), `GEANT4` (basics)
Tools/Software	Mathematica®, Jupyter Notebook, Bash, Gnuplot, LaTeX, Vim
Computer/Technical	Git and version control, 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 (Upper Intermediate), Polish (Upper Intermediate), Ukrainian (Native)

Professional Interests

Research Nuclear physics, Statistics and Machine Learning, Quantum Few-Body Physics, Data Science, Bayesian Statistics

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

Outreach

Coordination of activities on Fan Page Cząstki AGH on facebook

Attended the MCnet Summer School and Cracow School of Theoretical Physics in June 19-25 (2022)