Muhammad Wisal Abdullah

Lahore, Pakistan

+923337116161 | wisal.abdullah.m@gmail.com | github.com/wisabd | https://www.linkedin.com/in/muhammad-wisal-abdullah-007a6464/

Summary

Graduate student at the University of Bologna with a 2+ years of background in research in data analysis, machine learning, and high-performance computing. Experienced in extracting insights from complex datasets, building predictive models, and creating visualizations to communicate findings effectively. Skilled in Python specially data visualization tools, with ability to translate technical concepts into actionable insights for stakeholders. Passionate about leveraging analytics to solve real-world problems and drive decision-making. Looking to translate research training into industrial outputs, helping businesses make production-ready applied AI products and analytic tools.

Skills

Programming: Python, C/C++, Bash, MATLAB
Applied AI: Linear Regression, Deep Neural Networks (DNNs), GANs
Software Development Tools: Git, Debugging, Build Systems (CMake, Makefile)
Containerization & Cloud: Singularity
OS and Workflows: Linux Command Line, Research Data Management

Research

Hyperparameter optimization of BoloGAN *Hybrid (Geneva, Switzerland)*
Master Thesis at ATLAS collaboration, CERN *07/2024 - 03/2025*

- The project compares two distributions and evaluates the goodness of fit with reduced chi squares χ^2/ndf as the metric. One distribution is energy distribution Geant4 from dataset (csvFiles, rootFiles, binning.xml), the other is distribution is generated by the conditional WGAN-GP model.
- Tuned hyperparameters of the BoloGAN, a *conditional* WGAN-Gradient Penalty model simulating ATLAS calorimeter, using grid search algorithm based on the validation metric of reduced chi squares between Geant4 and generated energy distributions, on LXBATCH cluster at CERN.
- Developed python scripts for data analysis, bash scripts for running jobs on HPC system, utilized Tensorboard dashboards, and generated parallel coordinate graphs using Matplotlib.
- **Technical Skills:** Hypothesis testing, Bash, Matplotlib, Python, Tensorflow, Tensorboard, ROOT, HTCondor

Simulation and signal analysis of a system-on-chip *Daejeon, South Korea*
Undergraduate Individual Research Project at BMM lab https://bmm.kaist.ac.kr *02/2019 - 12/2019*

- Wrote MATLAB scripts to calculate Fast Fourier Transform of the bioelectrical signals, used structural mechanics module of COMSOL to conduct static analysis of displacement of the Multi electrode array, and designed chip using Autodesk 3dsMax.
- **Technical Skills:** MATLAB, Autodesk 3Ds Max, Comsol Multiphysics, Excel

Beyond Standard Model Simulations *Daejeon, South Korea*
Summer Research Intern at Korea Institute of Science and Technology Information (KISTI) *06/2017 - 08/2017*

- Wrote bash scripts to perform profiling of Geant4 simulation tooklit on Tachyon2 supercomputer, reinstalling newer version. Used Madgraph to simulate e+e- collision cross-sections and created Excel dashboards.
- **Technical Skills:** Bash, Excel, Madgraph

Opensource

Gradient boosting trees for bankruptcy prediction in Poland *2025*

- Developing a predictive model using gradient boosting trees to classify bankruptcy.

A/B Testing at WorldQuant University *2025*

- Developing a 3-tier interactive web dashboard integrating the hypothesis testing process leading to improvement in student performance at the online learning platform.

Bayesian parameter estimation of spectral lines of galaxy *2022*

- To measure the strength and width of a spectral line task using Bayesian parameter estimation.

Education

Master of Science in Physics , *Universita di Bologna* | Bologna, Italy
Bachelor of Science in Electronics and Electrical Engineering, *Korea Advanced Institute of Science and Technology* | Daejeon, South Korea
GCE A-level Sciences, Computer Science, *Lahore Grammar School JT Boys* | Lahore, Pakistan

Relevant coursework

Graduate

- Practical Statistics for Physics and Astrophysics

- Statistical Mechanics
- Particle Physics
- Nuclear Physics
- Group Theory

Undergraduate

- Machine Learning
- Data Structures and Algorithms in C++
- Programming Structures in C
- Programming in Python
- Probability and Introductory Random Processes
- Mathematical Methods in Physics

Volunteer Projects

Low cost Wearable alarm bracelet, *KAIST Appropriate Technology Team* *2016-17*

- Used Amplitude Shift keying (ASK) for signal modulation, and implemented in Arduino programming language the communication between bracelet and radio warning system. The project secured Gold award in Korean Ministry of Science, ICT and Future Planning's 9th Creative Design Competition for the Neglected 90% at Seoul National University. Link to news report: KATT

Academic Honors

Unibo Action 2 Merit Scholar, 1 of 20 recipients of competitive scholarship based on academic merit & GRE score for 2 years *Italy*

Undergraduate Research Program, Secured competitive funding to do research for final project on on-chip technology *South Korea*

Gold Prize - Top 3 in 65 teams from all S.Korea, 9th Creative Design Competition for the Neglected 90%. *South Korea*

Global Research Intern, UST Global Research Internship Program [Acceptance rate: 7.6%] *South Korea*