Kadir Murat Tastepe

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Profile

M.Sc. Physics candidate specializing in computational high-energy physics, experienced in developing FPGA-based detector algorithms and real-time data processing systems. Passionate about understanding how the universe works and eager to develop new scientific skills to contribute to groundbreaking research in high-energy physics.

Education

Ruprecht-Karls-Universität Heidelberg 08.2025 (Expected)
M.Sc. in Physics *Heidelberg, Germany*

- Master's Thesis: FPGA Implementation of the General Triplet Track Fit using High-Level Synthesis (in progress)

Hacettepe University 04.10.2021
B.Sc. in Engineering Physics *Ankara, Turkey*

- Bachelor's Thesis: Monte Carlo Simulations in High Energy Physics.

Universität Duisburg-Essen (Erasmus+) 05.10.2017 - 31.03.2018
B.Sc. in Physics *Duisburg, Germany*

Work Experience

SAP SE Walldorf, Germany
Machine Learning Engineer / Working Student (On-site) *08.07.2024 – 08.07.2025*

- Developed end-to-end **Retrieval-Augmented Generation (RAG)** pipelines using **vector search** and **large language models** for intelligent question answering, and built **Flask APIs** to serve these features in **cloud-based applications**.
- Created **anonymized workflows** for model training, and **SlackBot** interactions.
- Explored the capab ilities, limitations, and potential bottlenecks of both **Agentic AI** and **Generative AI models** to inform **model selection**, **optimization**, and **deployment strategies**.

Big Data Analyst / Working Student (On-site) *15.06.2023 – 14.06.2024*

- Tracking several release-dependent adoption tasks for **Identity and Access Management (IAM)**.
- Monitored and created tickets for **Root Cause Analysis (RCA)** of the **cloud foundation software components**.
- Maintained **Wiki pages**, **JIRA dashboards**, and **custom filter queries** to enhance cross-functional transparency and alignment with key stakeholders.

Paul Scherrer Institute (PSI) Villigen, Schwitzerland
Student Researcher (On-site) *01.10.2023 – 13.10.2023*

- Measured the **charged-pion lifetime** ($\tau_\pi = 26.35 \pm 0.78\ (syst.) \pm 0.25\ (stat.)$ ns) and **branching ratio to electrons vs. muons** ($R_{e/\mu} = 1.1 \pm 0.2(stat.) \times 10^{-4}$) at the **$\pi$M1 beamline** using a detector setup of **scintillators**, a **degrader**, and a **calorimeter**.

Physikalisches Institut Heidelberg Heidelberg, Germany
Scientific Assistent (On-site) *01.07.2022 – 30.09.2022*

- Investigated the impact of increased **magnetic field strength** and **sensor thickness** on the physics performance of the **Mu3e** experiment to guide the **optimization of detector design**.
- Simulated the spectrometer's **magnetic field** using **neodymium magnets** ($Nd_2Fe_{14}B$) to seperate **electrons** and **positrons**, implemented in **Mathematica**.

The Scientific and Technological Research Council of Turkey Ankara, Turkey
High Performance and Grid Computing Center
Internship (Remote) *15.03.2021 – 15.09.2021*

- Project: TRUBA2023 (Turkish Science e-Infrastructure)

The Henryk Niewodniczański Institute of Nuclear Physics Kraków, Poland
Polish Academy of Sciences(IFJ-PAN),
Particle Physics Summer Student Programme
Intern/Summer Student (On-site) *08.07.2019 – 22.08.2019*

- Data analysis on **charged particle production** in **Xe-Xe collisions**.
- Simulated **laser light propagation** for the **Baikal-GVD** calibration system, implemented in **MATLAB** and **C++**.

Schools

Max Planck IPP Summer University for Plasma Physics and Fusion Research Greifswald, Germany
Summer Student (On-site) *12.09.2022 – 16.09.2022*

Wolfram Summer School
Visitor (Remote) *28.06.2021 – 16.07.2021*

Istanbul University Particle Physics Winter School (PFBU-2020) Istanbul, Turkey
Winter Student (On-site) *03.02.2020 – 07.03.2020*

Computing Skills

Operating Systems: Mac OS, Linux, Windows

Programming Languages: C/C++, Python, Bash, LaTeX, MATLAB, Mathematica

Simulation & Analysis: ROOT, MadGraph, MadAnalysis, Pythia, Delphes, Geant4

Tools: Vitis HLS, Vivado, CUDA, Docker, Cloud Foundry, OpenSearch, Flask, OpenAI, LangChain, Microsoft Office

Build Software: Make

Version Control: Git, BitBucket

Databases: PostgreSQL

Poster Presentations

Conference on Computing in High Energy Physics Kraków, Poland
FPGA Implementation of the General Triplet Track Fit *23.10.2024*

Campus Activities

Hacettepe University Physics Society Ankara, Turkey
Founding Member *13.11.2017 – 04.10.2021*

- Initiated and organized interdisciplinary conferences, workshops, excursions, and public outreach events to promote physics and foster inclusive scientific engagement across diverse age groups and communities.

Language Skills

Turkish: Native Language

English: C1 (CEFR)

German: B1 (CEFR)

French: A1 (CEFR)

Field of Interests

High Energy Physics

Computational Science

Mathematical Methods in Physics

Machine Learning

Hobbies

Hiking, Backpacking, Cooking, Kayaking, Playing Electric Guitar, Birdwatching, Science Communication