

# Kadir Murat Tastepe

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## PROFILE

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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

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- Ruprecht-Karls-Universität Heidelberg** 09.2025  
*M.Sc. in Physics* Heidelberg, Germany
- Master's Thesis: FPGA Implementation of the General Triplet Track Fit using High-Level Synthesis.
- 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

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- 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 capabilities, 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, Switzerland  
*Student Researcher (On-site)* 01.10.2023 – 13.10.2023
- Measured the **charged-pion lifetime** and **branching ratio to electrons vs. muons** including systematic and statistical uncertainties at the  **$\pi$ M1 beamline** using a detector setup of **scintillators**, a **degrader**, and a **calorimeter**.
- Physikalisches Institut Heidelberg** Heidelberg, Germany  
*Scientific Assistant (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<sub>2</sub>Fe<sub>14</sub>B)** to separate **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**  
**Polish Academy of Sciences(IFJ-PAN),**  
**Particle Physics Summer Student Programme**  
*Intern/Summer Student (On-site)*

Kraków, Poland

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

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**Max Planck IPP Summer University for Plasma Physics and Fusion Research**  
*Summer Student (On-site)*

Greifswald, Germany

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)**  
*Winter Student (On-site)*

Istanbul, Turkey

03.02.2020 – 07.03.2020

## COMPUTING SKILLS

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**Operating Systems:** Mac OS, Linux, Windows

**Programming Languages:** C/C++, Python, Bash, L<sup>A</sup>T<sub>E</sub>X, 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

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

Kraków, Poland

23.10.2024

## CAMPUS ACTIVITIES

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**Hacettepe University Physics Society**  
*Founding Member*

Ankara, Turkey

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

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**Turkish:** Native Language

**English:** C1 (CEFR)

**German:** B1 (CEFR)

**French:** A1 (CEFR)

## FIELD OF INTERESTS

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**High Energy Physics**

**Computational Science**

**Mathematical Methods in Physics**

**Machine Learning**

## HOBBIES

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