

Halidu Abdulai

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Education

Erasmus Mundus Joint Master's Degree Programme

Engineering of Data-intensive Intelligent Software Systems (EDISS); overall GPA: 4.82/5

Aug 2023 – Jul 2025

1. MSc, *Intelligent Systems (Computer Vision & Data Science)*; University of the Balearic Islands

Palma, Spain

2. MSc, *Computer Engineering*; Åbo Akademi University

Turku, Finland

Thesis: Employing Large Language Models for Systematic Extraction of Nanoparticle Designs from Scientific Literature [pdf], Grade: 10/10

Relevant Coursework: Artificial Intelligence, Machine Learning, Data Science, Embedded AI, GPU programming, Computer Vision & 3D Reconstruction, Image & Video Analysis, Image Indexing & Retrieval by Content, Medical Image Processing, Advanced Techniques in Data Mining (NLP-focused)

Karadeniz Technical University

BSc, Computer Engineering; high honors; Rank: 1/120

Trabzon, Turkey

Sep 2019 - Jul 2023

Feb 2022 - Jul 2022

- Erasmus+ Exchange Student: AGH University of Science and Technology, Krakow, Poland

Research Experience

NAP4DIVE

Europe Horizon Project

Research Assistant

Jan 2025 – Present

- Developed an evidence-based, zero-shot extraction framework using open-weight LLMs to reliably automate the extraction of nanoparticle design data from scientific literature.
- Created and open-sourced a dataset of 526 nanoparticle designs to serve as a benchmark for future research in the field.
- Develops machine learning models to predict the likelihood of nanoparticles crossing the blood-brain barrier (current focus).

Mirka Oy

Jeppo, Finland

Physics-Informed Machine Learning – Machine Scientist; Research Intern

Nov 2023 – April 2024

- Created a neuro-symbolic framework to identify fundamental physical laws from industrial time-series data. Developed a Python computational pipeline to combine deep learning models (the "neuro" component) with symbolic physical constraints, enhancing model generalizability and interpretability.

Turku University Hospital

Turku, Finland

Machine Learning Researcher (Part-time) – Apnea Prediction in Premature Infants

Oct 2023 – Jun 2024

- Developed deep learning models in PyTorch to analyze and interpret physiological time-series data (EDI, SpO2) from premature infants.
- Developed a custom data processing and feature extraction pipeline to manage noisy, real-world clinical data, resulting in the identification of key device artifacts.
- Focused on model interpretability to effectively communicate findings to clinical stakeholders, ensuring the relevance and trustworthiness of the algorithm's predictions.

Karadeniz Technical University

Trabzon, Turkey

Machine Learning Research Intern

Jul 2022 – Sep 2022

- Developed and optimized custom PyTorch deep learning pipelines for classifying hand and foot movements using high-dimensional EEG data.

- Conducted thorough feature engineering and exploratory data analysis on complex brain-computer interface datasets to identify the most informative features, which enhanced model performance and robustness.

Industry Experience

Huawei Health Lab R&D

Data Analytics; Intern

Helsinki, Finland

Jun 2024 – Sep 2024

- Designed ML-enabled dashboard (using Plotly Dash) to streamline data workflows (+30% efficiency)
- Led participant recruitment and ensured ethical collection of physiological data for wearable technology studies.
- Collaborated with multidisciplinary teams to develop strength-training algorithms, using ML methodologies to improve wearable technology development.

Bordo Bilişim Ticaret Ltd. Şti.

Software Engineer; Intern

Samsun, Turkey

Jul 2021 – Dec 2021

- Developed an e-commerce web application using Django, boosting the client's customer count by 10%.
- Developed "CovidTrack," a health tracking prototype for COVID-19 prevention among employees.
- Trained new interns, which directly increased workflow productivity by 7%.

Teaching Experience

Teaching Assistant – Edge AI, Åbo Akademi University, 2024–2025 (Prof. Sebastien Lafond)

- Provided assistance in lectures, labs, and student support for a graduate-level Edge AI course.

Publications & Manuscripts

- Abdulai H.***, Manresa-Yee C., Rexha H., Lafond S.; Evidence-based Zero-shot Extraction of Blood-Brain Barrier Related Nanoparticle Design Parameters Using Open-weight Language Models; *Under review*

Presentations & Talks

- Smaller Models, Bigger Impact: Evidence-based Zero-Shot Extraction of Nanoparticle Design Parameters from Scientific Literature; **Oral Presentation**; Computational Methods in Drug Discovery Symposium; University of Helsinki; Nov. 13, 2025
- Assessing the Applicability of Large Language Models for Nanomaterials Data Mining: A Case Study on Extracting BBB-Related Nanoparticle Design Parameters; **Oral Presentation**; Doctoral Students Symposium, Åbo Akademi University; Oct. 3, 2025
- Enhancing AI with Real-World Laws: The Role and Impact of Physics-Informed Machine Learning; **Oral Presentation**; 5th Global Summit on Artificial Intelligence Webinar, (Heighten Science Publications Inc). Apr. 22, 2024

Leadership

Erasmus Mundus Association (EMA) – Country Representative (Ghana)

Jul 2025 – Present

- Leads and coordinates Erasmus Mundus activities in Ghana. Acts as the main liaison between Ghanaian students and EMA.

Erasmus Mundus Association (EMA) – Programme Representative (EDISS)

May 2024 – Present

- Represents the EDISS programme within the EMA network. Coordinates activities and reports on EDISS programme initiatives.

African Students in Trabzon Association (ASTRA) – Vice President

Nov 2021 – Nov 2022

- Organized cultural, academic, and support activities for the African student community in Trabzon, Turkey. Led organizational meetings and represented student interests to local institutions.

Skills

- Programming Languages:** Python, C, C++, Java, JavaScript, MATLAB
- Machine/Deep Learning:** PyTorch, Tensorflow, Keras, OpenCV, Scikit-Learn, MLFlow, OpenMP/MPI
- Spoken Languages:** English (Native/Bilingual), Turkish (C1), Spanish (B1)

Selected Awards, Grants, & Honors

- Åbo Akademi University, Most Promising International Master's Student Award (€5,057). Recognized for outstanding research potential. June 2025
- Grand Prize, Nokia Challenge Finland: First place in the Nokia hackathon for AI-based network optimization. Nov 2023
- Erasmus Mundus Scholarship for Double Degree Master's Programme (EDISS – 5.6% acceptance rate) Aug 2023
- Best Graduating Student (1/120), Computer Engineering Department, Karadeniz Technical University Jul 2023
- Fully Funded Turkish Government Scholarship Awardee Sep 2018

Referees

References available upon request.