

Dr. Abedal-Kareem Al-Banna

Assistant Professor — Data Science & Artificial Intelligence · Entrepreneur & Innovator in AI and Speech Technology

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PROFILE

Jordanian academic, entrepreneur, developer, and researcher specialising in artificial intelligence, machine learning, and speech technologies, with a research career spanning Jordan and the United Kingdom. Dedicated to bridging academic research and practical industry applications in speech processing, healthcare technology, IoT, and robotics — as an educator, developer, startup founder, and mentor of award-winning student teams in national and international competitions.

EDUCATION

PhD in Computer Science

2023

Loughborough University, United Kingdom

Thesis: *Machine Learning Based Approaches to Automatic Stuttering Event Detection* — deep learning models based on time-interval annotation for disfluency detection, using novel attention-based architectures and multi-feature fusion.

MSc in Computer Science

2004

Amman Arab University, Jordan

BSc in Information Technology

2001

Al-Balqa Applied University, Jordan

PROFESSIONAL CERTIFICATIONS

- PCED™ — Certified Entry-Level Data Analyst with Python (Python Institute)
- MCP — Microsoft Certified Professional
- Rational Unified Process (RUP) Certification (IBM Rational)

ACADEMIC APPOINTMENTS

Assistant Professor

Present

Department of Data Science & Artificial Intelligence, Faculty of Information Technology, University of Petra, Jordan

Research Affiliate

Present

Loughborough University, United Kingdom

RESEARCH INTERESTS

Speech disorder detection (stuttering event detection in continuous speech) · Deep learning architectures for speech and signal processing · Attention-based models and multi-feature fusion · Domain adaptation for robust AI systems · AI-driven assistive and healthcare technologies · IoT · GIS · Robotics

TEACHING

University Courses — University of Petra

- Deep Learning
- Data Structures
- Algorithms
- Software Engineering
- Web Development
- Data Analysis with Python (Advanced)
- Programming Language 1 (Java)
- Computing Systems for Data Science & AI
- DevOps — Hands-on Lab (Docker, Kubernetes, CI/CD, IaC, Cloud)
- Robotics with ROS2

Online Teaching — Founder & Author, Al-banna Tutorials (albanna-tutorials.com)

Advanced AI learning platform with interactive tutorials, including:

- LLM Agents & Building ReAct Agents
- Model Context Protocol (MCP) & Agent-to-Agent Protocols (A2A)
- Transformer Architecture & Text Classification with Transformers
- Mixture of Experts in LLMs
- Diffusion Models
- LangChain (fundamentals & chatting with databases)
- PyTorch Interview Practice (TorchCode)
- Django Web Development & Deployment on IIS
- Git & GitHub for Developers
- Workflow Automation with n8n

SELECTED PUBLICATIONS

Al-Banna, A.-K., Fang, H., Edirisinghe, E. (2024). A Novel Attention Model Across Heterogeneous Features for Stuttering Event Detection. *Expert Systems with Applications*.

Al-Nashashibi, M. Y., El-Khalili, N., Hadi, W., Al-Banna, A.-K., Issa, G. (2024). Identifying the Most Significant Features for Stress Prediction of Automobile Drivers. *Journal of Information & Knowledge Management*.

Al-Banna, A.-K. (2023). Machine Learning Based Approaches to Automatic Stuttering Event Detection. *Doctoral Thesis, Loughborough University*.

Al-Banna, A.-K., Edirisinghe, E., Fang, H., Hadi, W. (2022). Stuttering Disfluency Detection Using Machine Learning Approaches. *Journal of Information & Knowledge Management*.

Al-Banna, A.-K., Edirisinghe, E., Fang, H. (2022). Stuttering Detection Using Atrous Convolutional Neural Networks. *ICICS 2022, IEEE*.

AWARDS & HONOURS

World Robot Championship — Caspian Cup: 1st & 2nd Place Worldwide (Supervisor) 2026

Supervised two University of Petra teams in Baku, Azerbaijan: team "Palm Guard" won 1st place worldwide and the Best Engineering Innovation award; team "NeuroSeeker" secured 2nd place worldwide in the Open Category.

Leaders in Innovation Fellowship 2020

Royal Academy of Engineering, United Kingdom — awarded for innovative work in technology and entrepreneurship.

LIF Community Grant 2020

Higher Council for Science and Technology & The Royal Academy of Engineering.

Best Inventor, University of Petra 2019, 2022

Recognised twice for the Portable Neck Treatment Device patent.

Best Inventors in Jordanian Universities 2019

Awarded by the Minister of Higher Education, Jordan.

Intel Award — Best IoT Device, MENA Region 2015

Recognised in Lebanon for innovation in Internet of Things technology.

Best Software Idea in Jordan

2011

Honoured by His Majesty King Abdullah II of Jordan — Dead Sea, Jordan.

30+ Student Competition Awards (as mentor)

2010–2026

Mentored student teams to victories in national and international competitions, including the World Robot Caspian Cup, Microsoft Imagine Cup, Intel Challenge Me, and Amazon Hackathon.

PATENTS

Portable Neck Treatment Device

2018

Co-invented with Majed Naser Albanna, Ghassan F. Issa, Ghiath Mhd Kheir Eriksousi, and Tamara Aljuboori.

ENTREPRENEURIAL VENTURES

Sygma — Founder

AI-driven company developing intelligent systems in artificial intelligence, document intelligence, and smart data processing, bridging academic research with enterprise applications.

Deep Brain — Founder & CEO

Startup developing cutting-edge AI applications combining academic research with practical industry solutions.

TAKALAM — Co-founder & CTO

Jordanian startup providing AI- and speech-processing-based assistive solutions for hearing and speech disorders.

Leaders in Innovation Club — Founder

Organisation fostering innovation and technology development through mentorship and networking for aspiring entrepreneurs.

PROFESSIONAL AFFILIATIONS

- Vice Chair — IEEE Computer Society / Computational Intelligence Society (CS/CIS), Jordan Branch
- Member — Leaders in Innovation Fellowship community, Royal Academy of Engineering
- Research affiliation — Loughborough University, UK
- Faculty member — University of Petra, Jordan