Mahmoud Sameh

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A highly motivated and communally active Electrical Engineering Graduate (4.95/5 GPA, top of the 61st engineering batch, Islamic University of Madinah) specializing in Artificial Intelligence and Control Systems. Demonstrated leader in university initiatives and national competitions, including selection for the prestigious KAUST AI Summer Training Program (top 100 nationally) and a significant contribution to a national victory (Prize of 150K) in SDAIA's Enjaz Hackathon. An avid learner, supplemented formal education with advanced coursework from global institutions such as Harvard, KAUST, KFUPM, the University of Michigan, and more. Possess extensive experience developing end-to-end solutions combining hardware (Embedded Systems, Robotics) and software (Python, C, Deep Learning frameworks), incorporating robust analytical and mathematical approaches. Proven expertise in creating, training, and applying novel methods to diverse deep learning architectures, including pretrained/foundation models like YOLOv11 and SAM 2, to achieve specific research objectives. Eager to apply advanced technical skills to challenging problems and contribute to research in engineering and deep learning.

EDUCATION

Islamic University of Madinah
Graduated June 2025
Bachelor of Science (B.S.) in Electrical Engineering

- GPA 4.95/5 (Academic Record) (External Courses)
- IELTS Band 8 (Test)
- DET 150/160 (Test)

WORK EXPERIENCE

Aajil **Oct. 2025 – Present**
Ai Engineer (Full-time)

- Took part in creating the ai infrastructure to automate and accelerate credit risk assessment.
- Developed the system that generates crucial financial analyses and features from raw data.
- Participated in the deployment and MLOps of different classification and extraction models.
- Facilitated the communication between SMEs/stakeholders and the ai team for feedback and pain-point identification.

King Fahd University of Petroleum and Minerals **Jun. 2025 – Aug. 2025**
Research Assistant (Full-time)

- Lead the design of a complete experimental protocol for creating a novel hyperspectral imaging dataset of date fruits, outlining the logistical workflow for sample scanning, standard oven-drying for ground truth validation, and data management.
- Developed the software needed for the lab hyperspectral hardware (created a complete system).
- Created an integrated GUI program to ease the analysis, calibration, and creation of hyperspectral data cubes for any researcher.

Islamic University of Madinah **Apr. 2023 – Jun. 2025**
Engineering College Student Contributor (Part-time)

- Enhanced the Engineering College's visibility by managing social media presence and creating content.

- Led student teams on college-level projects, offering technical insights and fostering teamwork.
- Contributed to shaping the college's public identity.
- Provided student perspective and feedback to faculty/staff regarding program initiatives and student engagement.

SKILLS

- Deep Learning
- Computer Vision
- Embedded Devices Programming
- Python (inc. Pytorch/Tensorflow/Pandas/CV2)
- Academic Research
- Leveraging Latest AI Tech
- Digital Signal Processing
- C Language
- Javascript/Django/HTML/CSS
- Circuit Design/Analysis
- Simulink/Simscape/MATLAB
- Control Theory
- SQL
- Data Preparation & Preprocessing

PROJECTS

- **Efficiently Adapting SAM 2 for Hand Drawn Circuit Diagram Segmentation** *(Research Paper)*
  Led research to efficiently adapt the SAM 2 foundation model for high-detail circuit segmentation in a low-data regime using a novel Parameter-Efficient Fine-Tuning (PEFT) strategy.
  Key Technologies: Python, PyTorch, LoRa, PEFT, Transformers
- **CircuitVision: AI-Powered Recognition and Analysis of Hand-Drawn Electrical Circuits** *(2nd Best Graduation Project in AI University-Wide)*
  Led development of a novel end-to-end system to convert circuit diagrams into simulatable netlists using a modular AI pipeline of object detection, CV algorithms, and a Large Foundation Model (SAM2).
  Key Technologies: Python, PyTorch, YOLOv11, OpenCV, SAM 2, Streamlit, PySpice
- **Nathir (ناظر): AI Legal Case Classification System** *(Enjaz Hackathon National Winner - 150,000 SAR Prize)*
  Co-developed an AI system to classify legal cases by implementing advanced prompt engineering for the Google Gemini LLM to interpret user input against the Saudi legal framework (winner prototype).
  Key Technologies: Python, Google Gemini API, Prompt Engineering, LLM Integration
- **Real-Time Fall Detection using YOLOv11 for Assistive Monitoring**
  Developed and fine-tuned a YOLOv11 model on a public dataset to identify fall events from images in real-time, achieving a ~5ms inference speed suitable for assistive applications.
  Key Technologies: Python, PyTorch, YOLOv11
- **AI for Housing Defaulter Prediction & Critical Case Detection** *(DAL Datathon)*
  Developed a dual-solution AI system using XGBoost for regional defaulter forecasting and a Restricted Boltzmann Machine (RBM) for critical case anomaly detection.
  *Key Technologies***:** Python, XGBoost, Restricted Boltzmann Machines (RBM), Pandas, Scikit-learn
- **Explainable AI for Cardiovascular Disease Risk Prediction using SHAP**
  Applied Explainable AI (XAI) techniques to a CVD risk prediction model, using SHAP to interpret global feature importance and local, patient-specific predictions.
  Key Technologies: Python, Scikit-learn, Pandas, SHAP, Matplotlib, Logistic Regression
- **Realigning Control System Labs: Bridging Theory with Practical Application**
  Initiated and led a student-driven project to enhance the Control Systems lab curriculum by introducing

advanced MATLAB tools (System Identification) and real-world problem-solving exercises and experiments.
Key Technologies: MATLAB, Simulink, System Identification Toolbox

For More Details & Projects: https://www.linkedin.com/in/mah-sam/details/projects/
https://github.com/mah-sam?tab=repositories

COURSES

- **Harvard University's CS50 (3 Courses)**
- **KAUST Academy (Successfully Passed All 3 Stages)**
- **Deep Learning Specialization (5 Courses)**
- **Michigan Python Specialization (5 Courses)**
- **Python 3 Programming Specialization (4 Courses)**
- **Mathematics for Machine Learning and Data Science Specialization (2 Courses)**

For a Comprehensive List & Viewing The Certificates: Direct Link

PARTICIPATION & ACKNOWLEDGMENT

- **Aramco & RDIA's - AI Co-Innovation** *(Sep. 2025) (Certificate)*
- **Acknowledgement of Academic Excellence** *(May. 2025) (Certificate)*
- **13th International Cultural Festival** *(Apr. 2025) (Certificate)*
- **KSU Engineering Day Competitions** *(Feb. 2025) (Certificate)*
- **Enjaz Hackathon** *(Jan. 2025) (Certificate 1) (Certificate 2)*
- **WRO Saudi 2023 RoboSport** *(Oct. 2023) (Certificate)*
- **International Conference on Cyber Terrorism** *(Dec. 2022) (Certificate)*

PUBLICATION

- **HSI Control Suite: An Integrated GUI for Operating and Acquiring Data from DIY Push-Broom Hyperspectral Imaging Systems**
  Mahmoud Sameh, Ali Albeladi, and Ahmed Fawzy ***Abstract***
  ***Status**: Submitted (Softwarex)*
- **Efficiently Adapting SAM 2 for Automated Schematic Capture from Hand-Drawn Circuit Diagrams**
  Mahmoud Sameh, Adel BenAbednnour, and Jawad K. Ali ***Abstract***
  ***Status**: Under peer-review (IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems)*
- **Real-Time Human Fall Detection from Video Using YOLOv11 with Pose Estimation: A Paradigm Shift Towards Efficient Transformer-Based Architectures**
  Adel BenAbdennour, Mahmoud Sameh, Bilal A. Khawaja, Arshad Karimbu Vallappil, Abdulmajeed M. Alenezi, Qammer H. Abbasi, and Sameer Qazi ***Abstract***
  ***Status**: Under peer-review (IEEE Access)*