Mahmoud Gamal
Machine Learning Engineer

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Education

Fayoum University

BSc in Mechatronics Engineering. *2018- 2023*

- Grade: B (Very good)

Skills

knowledge	Machine/Deep Learning, Computer Vision, Image Processing, Control Systems, Mechatronics Systems
Programming	Python, Bash, PyQt5, Streamlit, MATLAB/Simulink, Git, LaTeX
Machine Learning	TensorFlow, Scikit-learn, OpenCV, NumPy, Librosa
Data Analysis	Pandas, Seaborn, Power BI, MySQL
Languages	Arabic (Native), English (Fluent)

Projects

EDvanced:

- Developed an end-to-end system to extract and analyze answers from scanned bubble sheets using OpenCV, OCR, and ArUco markers, enabling accurate identification of student responses and IDs.
- Implemented a transparent and explainable cheating detection pipeline by combining statistical analysis with clustering algorithms (DBSCAN + PCA), flagging suspicious patterns using p-value assessments and visual cluster insights.
- Built a fully interactive Streamlit web app allowing users to upload exam sheets, visualize score distributions, review individual results, and explore 3D clustering plots.

OGallery:

- Developed an open-source Linux gallery app using PyQt5 with advanced image search and editing capabilities
- Trained a MobileNet classifier for image categorization and applied Levenshtein distance for typo-tolerant search
- Improved performance by implementing a custom caching mechanism for efficient image loading

ADAS perception module(Graduation project):

- Implemented an image processing pipeline for lane detection using OpenCV.
- Collected road data, for instance segmentation, developed code to convert it to the appropriate label format, and fine-tuned YOLOv5 on the custom dataset. Additionally, performed object detection by collecting cars and traffic signs data, fine-tuning YOLOv5 on the custom dataset, and successfully deployed it on Raspberry Pi.

Heart disease classifier:

- Conducted data exploratory analysis and data visualization using pandas and Seaborn.
- Trained and evaluated models, performed hyperparameter tuning using grid search.

Work experience

Samsung Electronics Egypt

Internship *Aug 2023 - Oct 2023*
- Optimization and maintenance of assembly line AGVs

Siemens energy-EGTA

Training *Aug 2020 - Sept 2020*
- Summer training on Electrical Engineering (Renewable Energy, Automation, Power Plants)

Publications & Contributions

- Published technical articles covering topics such as, **color palette extraction with k-means clustering**, **steganography techniques using python**
- Created synthetic **dataset** of Egyptian ID cards with randomized personal details and StyleGAN2-generated headshots
- **IEEE FSB Robotics team head** (2020-2021): Founded team, developed curriculum, tutored robotics fundamentals
- **Fab Lab Fayoum Volunteer** (2019-2021): Provided technical support for visitors

Related courses

ML Data Lifecycle in Production | **Intro to ML in production** | **Neural Networks and Deep Learning** | **Improving Deep Neural Networks** | **Convolutional Neural Networks(audit)** | **ST121:probability and statistics (audit)** | **Stanford CS229: Machine Learning (audit)**