

Kirollos Hanna

AI/ML Engineer

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- **AI & Machine Learning Expertise:** Developed and optimized machine learning models, achieving high accuracy in AI labeling, speech emotion recognition, and anomaly detection, with a distinction-grade MSc in AI.
- **Industry & Research Experience:** Led an AI Labelling Assistant project with BT Group, improving image classification accuracy with few-shot learning; worked as an AI Data Annotator, debugging AI-generated outputs.
- **Software Development & Problem-Solving:** Designed a multi-office car rental system and implemented various AI-powered projects, optimizing databases, improving model efficiency, and achieving the highest F1 score in a sales forecasting competition.

EXPERIENCE

DataAnnotation.tech

Sept 2024 – Present

AI Data Annotator (Remote, Part-time)

- **AI Model Evaluation & Debugging:** Conducted in-depth analysis of AI-generated coding solutions, identifying and resolving errors, improving output accuracy.
- **Prompt Engineering & Model Assessment:** Designed and tested diverse prompt variations to benchmark AI performance across multiple tasks, enhancing response consistency.
- **Comparative Analysis & Feedback:** Evaluated outputs from various AI models, identifying key improvement areas and providing structured feedback that contributed to an increase in models precision.

BT Group

Jan 2024 – Sept 2024

AI Researcher (Master's Thesis Project)

- **AI Model Development & Optimization:** Designed and implemented an AI Labelling Assistant capable of accurately classifying images with as few as 10 training samples per class, achieving 87.3% accuracy on the Intel Image Classification dataset.
- **Generalization & Adaptability:** Engineered the model to handle diverse image types and used a novel approach for out of distribution (OOD) detection with recall 100% on certain OOD tests, ensuring robust performance in open-world scenarios.
- **Industry Collaboration & Deployment:** Partnered with BT Group and Prof. Hani Hagrais to refine and integrate the AI solution, leading to a high-accuracy automated labeling system adopted for industrial use.

SKILLS

- **Technical Skills:** Python, C/C++, MATLAB, Java, SQL, PostgreSQL, HTML, JavaScript, CSS, TensorFlow, PyTorch, Scikit-learn, Pandas, NumPy, OpenCV, Librosa, Seaborn, Matplotlib, Git/GitHub/GitLab, Machine Learning, Deep Learning, Few-shot Learning, Semi-supervised Learning, Transfer Learning, Time Series Analysis, Image Processing, Speech Emotion Recognition, Anomaly Detection, Computer Vision, Natural Language Processing (NLP), Data Preprocessing, Feature Engineering, Dimensionality Reduction (PCA, LDA), Data Visualization, Statistical Analysis, Model Evaluation & Optimization, Hyperparameter Tuning, Web Development, Database Management, Remote Project Management
- **Soft Skills:** Analytical Thinking, Problem-Solving, Critical Thinking, Research & Development, Adaptability, Communication, Teamwork, Collaboration, Attention to Detail, Time Management, Leadership, Creativity, Self-Motivation, Decision-Making, Project Management

PROJECTS

Rossmann Store Sales Prediction | Dec 2023

- **Deep Learning Model Implementation:** Designed and developed an LSTM-based model for time-series forecasting, achieving the highest F1 score among all course teams.
- **Feature Engineering & Visualization:** Extracted key sales trends, conducted confusion matrix analysis, and engineered features to enhance model accuracy.
- **Hyperparameter Optimization:** Fine-tuned model parameters, improving predictive performance and robustness for retail sales forecasting.

Fuzzy Logic for Robot Navigation | Dec 2023

- **Autonomous Navigation System:** Developed a TurtleBot3 navigation system using Type-1 fuzzy logic for obstacle avoidance

and edge following.

- **Sensor Integration & Real-Time Decision Making:** Implemented LIDAR-based fuzzy inference to adjust paths and navigate complex environments dynamically.
- **Performance Optimization:** Refined fuzzy membership functions, increasing navigation accuracy and stability in dynamic scenarios.

Speech Emotion Recognition | May 2023

- **Multi-Model Deep Learning Approach:** Built 1D CNN (TensorFlow) and 2D CNN (PyTorch) models to classify emotions from speech, achieving high accuracy.
- **Feature Extraction & Preprocessing:** Utilized MFCCs and spectrograms with Librosa to enhance speech representation for robust model training.
- **Comparative Performance Analysis:** Evaluated 1D vs. 2D CNN architectures to determine the most effective approach for emotion classification.

Network Anomaly Detection | April 2023

- **Security-Driven AI Solution:** Developed a machine learning-based system to detect irregular network traffic patterns, improving anomaly detection accuracy.
- **Dimensionality Reduction & Data Processing:** Implemented PCA from scratch, reducing dataset complexity while maintaining essential predictive features.
- **Custom KNN Classifier:** Built a KNN-based anomaly detection model, achieving high detection accuracy in identifying suspicious network activity.

Face Recognition System | Feb 2023

- **Machine Learning-Based Face Detection:** Developed a recognition system leveraging PCA, LDA, and KNN, enhancing classification accuracy.
- **Image Processing & Feature Reduction:** Applied dimensionality reduction techniques to optimize model efficiency while preserving key facial features.
- **Performance Optimization:** Fine-tuned classification parameters, significantly improving face detection precision.

Car Rental System | Dec 2022

- **Full-Stack Web Development:** Designed and deployed a multi-office car rental system, enabling global customer access and streamlined vehicle management.
- **Role-Based Access & Security:** Implemented secure login, user validation, and administrative controls to enhance system integrity.
- **Search & Booking Optimization:** Developed advanced filtering and payment integration, improving reservation efficiency and customer experience.

EDUCATION

University of Essex – School of Computer Science and Electronic Engineering

2024

MSc in Artificial Intelligence

- **Thesis:** AI Labelling Assistant – an industrial project in collaboration with BT Group
- **Grade:** Distinction

Alexandria University, Egypt

2023

Bachelor of Science in Computer and Communication Engineering