Mohamad Halabi

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EDUCATION

Lebanese University **Hadath, Lebanon**

Diploma in Computer and Telecommunication Engineering (equivalent to Masters) *Graduation Date: Sep 2024*

PROJECT EXPERIENCE

Oreyon **Beirut, Lebanon**

Lebanese Coin Counting with Computer Vision *Aug 2024 - Sep 2024*

- Data Collection & Annotation: Conducted comprehensive data collection and annotation to create a high-quality dataset of 250 lira and 500 lira Lebanese coins for model training and evaluation.
- Model Development: Built and fine-tuned a YOLOv8-based computer vision model to accurately detect coins, achieving a 98% accuracy rate in classification and counting.
- Logic Implementation: Developed robust logic to calculate the total coin value, providing accurate monetary totals based on coin count.
- Outcome: Delivered a reliable coin-counting solution with high accuracy, demonstrating strong object detection and model optimization skills.

Hand Gesture-Based Binary Counter Using MediaPipe *Aug 2024 - Sep 2024*

- Overview: Developed a computer vision application using MediaPipe to detect and interpret hand gestures, designed as an educational tool for teaching binary numbers.
  Gesture Recognition: Mapped each finger's position (flexed or extended) to binary digits, enabling accurate binary-to-decimal conversion through visual cues.
  Binary Counting Implementation: Enabled counting from 0 to 31 with a single hand by transforming the binary representation into decimal values, demonstrating real-time binary counting.
  Impact: Leveraged computer vision technology to provide a hands-on, interactive approach to understanding binary numbers, enhancing learning engagement and comprehension.

Lebanese University **Hadath, Lebanon**

Sign Language Recognition System using Data Gloves *Feb 2024 - Sep 2024*

- Overview: Designed and engineered a sensory glove to capture and interpret hand gestures for Arabic Sign Language recognition, enhancing accessibility for Arabic-speaking users.
- Data Collection & Processing: Built a data pipeline that gathered and organized 3,000+ data points, ensuring high-quality inputs for model training and testing.
- Static Gesture Recognition: Built a machine learning model for static sign recognition using Support Vector Machine (SVM) and Multi-Layer Perceptron (MLP) algorithms, achieving 96% accuracy in testing.
- Dynamic Gesture Recognition: Created a dynamic gesture recognition model that combines static gestures (letters) with Long Short-Term Memory (LSTM) networks, achieving a 94% accuracy rate.
- Real-Time Recognition System: Developed an end-to-end real-time recognition system that captures hand gestures, displays outputs, forms words from letters, and assembles coherent phrases.
- API Integration: Leveraged the Gemini API to transform discrete words into coherent phrases, improving user interaction and comprehension.
- Text-to-Speech Conversion: Implemented text-to-speech applications using ElevenLabs and gTTS for Arabic language support, significantly enhancing user accessibility.

SMS Spam Detection using Naive Bayes and TF-IDF *Apr 2023 - Jun 2023*

- Led a project to detect SMS spam messages using a Naive Bayes classifier with TF-IDF feature extraction.
- Utilized scikit-learn to preprocess text data and compute TF-IDF vectors.
- Implemented the classifier to categorize messages and evaluated performance using accuracy, precision, and recall, achieving robust results.

SKILLS

Programming languages: Python, C/C++/C#

Python Libraries: Numpy, Matplotlib, Pandas, scikit-learn, Seaborn

Computer Vision & Image Processing: OpenCV, MediaPipe, YOLOv8, Roboflow

Machine Learning Frameworks: TensorFlow, PyTorch, YOLOv8, Hugging Face Transformers, Keras

Operating System: Windows, Linux

Version Control: Git, GitHub

LEADERSHIP EXPERIENCE

ULFG-AI CLUB **Hadath, Lebanon**

Tutor *Nov 2023 - Present*

- Tutored university students on AI and Machine Learning concepts.
- Conducted a workshop to introduce students to the principles of working on machine learning projects.

CYBERSECURITY CLUB **Hadath, Lebanon**

Tutor *2022 - 2023*

- Tutored university students the subject of Network essentials.
- Developed expertise in cybersecurity tools and Linux commands through active participation in the university's Cybersecurity Club.
- Successfully solved challenging security vulnerabilities on Vulnhub platform.

LANGUAGE

English: Intermediate

French: Delf-b2

Arabic: Native