Abdelrahman Hazem Khalil

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Profile

Enthusiastic Mechatronics Engineering student with hands-on experience in robotics, machine vision, and automation. Skilled in Python, C, MATLAB, and tools like SolidWorks and Automation Studio. A fast learner, team player, and tech tinkerer passionate about building smart systems and solving real-world problems with creativity and code.

Language

Arabic:Native speaker

English: Good working knowledge

Education

2021 → 2025

Bachelor of Engineering (Hons.) in Mechatronics Engineering
Asia Pacific University of Technology & Innovation (APU), Kuala Lumpur
Expected Graduation: July 2025

Experience

Feb 2024 → Jun 2024

Machine Vision Intern, Control Easy Technology Sdn. Bhd.

- Developed and optimized machine vision algorithms for a real-time quality inspection system on automotive ECUs
- Utilized the Zebra VS40 smart camera to detect surface scratches and bent pins on ECU components
- Fine-tuned lighting, image processing logic, and inspection thresholds to boost detection accuracy
- Gained practical experience in industrial vision systems and automated defect classification in a production environment

Skills

Python & C Programming	**Skilful**	MATLAB	**Skilful**
ROS 2	**Beginner**	CX Programmer / Designer	**Beginner**
SolidWorks	**Skilful**	Automation Studio	**Skilful**
Media Pipe	**Skilful**	ESP32 & Arduino	**Skilful**
OpenCV	**Skilful**	Gazebo, SLAM & RVIZ	**Beginner**

Projects

AI-Powered Humanoid Robot (FYP) – *2025 (Ongoing)*

- Developed a ROS 2-based humanoid robot capable of voice interaction, gesture recognition, and autonomous navigation.
- Integrated MediaPipe for motion detection and enabled robotic arm movement via ESP32 and PCA9685.
- Implemented GUI and RViz interfaces for real-time control and feedback.

Smart AGV for Chili Farm Monitoring (GDP) – *2024–2025*

- Led the machine vision module to detect diseased chili plants using a custom-trained model.
- Designed and tested an intelligent spraying system for targeted agricultural treatment.
- Collaborated with a multidisciplinary team handling AGV navigation, electronics, and design.

Scratches and Bent Pins Scanner

- Designed a vision-based inspection system to detect surface scratches and bent pins on automotive ECUs using the Zebra VS40 smart camera.
- Ensured high accuracy and reliability for quality control in industrial settings.

CNC Turning Process Simulation

- Simulated and validated CNC turning operations using CNC Simulator Pro.
- Applied tool selection, material setup, and G-code programming to optimize machining accuracy and efficiency.

Automatic Stamping System

- Simulated an automated stamping sequence using CX Programmer and CX Designer.

Automated Storage Elevator System

- Designed and implemented an elevator-based storage system using pneumatic air cylinders for motion control.

Bumper Car Model Design

- Created a full mechanical model of a bumper car using SolidWorks.

Vaccination Monitoring System

- Developed a C-based embedded system for real-time vaccine quantity tracking.

MATLAB Problem Solver

- Built mathematical solution scripts and visualizations using MATLAB.

Voice Assistant and Image Recognition Tools

- Developed Python-based personal automation tools combining speech recognition and image analysis.