Basheer Al-Tawil
Robotics Engineer — AI and Computer Vision Expert — IoT Developer
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Professional Summary

Robotics Engineer with over 4 years of experience in AI, computer vision, automation, and embedded systems. Skilled in improving robotic systems, applying machine learning algorithms, and integrating computer vision techniques for industrial and agricultural automation. Proficient in ROS, Python, C++, and machine learning frameworks (TensorFlow, PyTorch). Strong background in designing robotic arms, mobile robots, and AI-based solutions to optimize efficiency and solve complex engineering challenges. Multilingual communicator fluent in Arabic, English, and Turkish, with basic proficiency in German.

Core Skills and Technologies

- **Robotics:** ROS/ROS2, SLAM, Navigation, Mobile Robotics
- **AI/ML:** Computer Vision, CNNs, TensorFlow, PyTorch
- **Embedded Systems:** Arduino, Raspberry Pi, STM32, IoT, PCB Design
- **Programming:** Python, C++, MATLAB, OpenCV
- **CAD/Simulation:** SOLIDWORKS, Gazebo, RVIZ, MOVEIT

Professional Experience

Product Development Manager
Electronics Company, Istanbul, Turkey — Apr 2022 – Jan 2023

- Led creation of **3** educational mobile robots and **2** IoT devices, improving client efficiency by **20%**.
- Set up production for more than **5000** units, supporting B2B and B2C sales in multiple countries.

Founder and Technical Lead
iFarm Startup, Izmir, Turkey — Jun 2020 – Jul 2022

- Built 2 AI and IoT hydroponic farming tools, increasing crop yield by **50%** and reducing water use by **95%**.
- Secured $50,000 funding and partnered with **3** agricultural firms and accelerators.

Research and Development Engineer
Lazer Market, Izmir, Turkey — Nov 2019 – Feb 2020

- Engineered automation system for CO2 laser cutter, cutting time by **50%** and boosting output by **50%**.
- Created HMI, raising user satisfaction by **20%** and lowering training time by **30%**.

Robotics Engineer
FabLab Izmir Municipality, Izmir, Turkey — Apr 2019 – Oct 2019

- Created and programmed a 6DoF robotic arm for industrial automation applications.
- Integrated custom CNC machine for enhanced design and automation processes.

Automation Engineer Intern
Delta Process Automation, Izmir, Turkey — Jun 2018 – Aug 2018

- Configured **3** control circuits and programmed PLC systems for **2** projects.

Industrial Engineer Intern
BOTAS, Izmir, Turkey — Jul 2017 – Oct 2017

- Analyzed **5** manufacturing processes, helping cut production costs.

Education

PhD, Mobile Robotics and Computer Vision
Otto-von-Guericke-University, Germany — Aug 2023 – Present
Master's in Robotics Engineering
Izmir Katip Çelebi University, Turkey — Feb 2020 – Feb 2023
Bachelor's in Mechatronics Engineering
Izmir Katip Çelebi University, Turkey — Oct 2014 – Sep 2019

Projects

Develop a Hydroponic Control System — Python, C, Arduino, Embedded System
Designed a custom control board (Python, C, Arduino) for automated hydroponic farming. [Video Link]
Mobile Robot Manipulator: Design and Simulation using ROS, C++, Python, SOLIDWORKS. [GitHub Link]
5DoF Robotic Arm: Development and Testing with ROS Integration— ROS, C++, Python, SOLIDWORKS
Built URDF models for 5DoF arm, simulated in RVIZ and MOVEIT, achieving 95% path planning accuracy. [GitHub Link]
Improve a Handheld Mechanical Ventilator— C, Python, Arduino, MATLAB
Engineered ventilator motion mechanism with **60%** efficiency, exceeding **50%** target and cutting costs by **40%**. [Blog Link]
Mini CNC Machine: Construction and Programming with Arduino and SOLIDWORKS [GitHub Link]
Develop a small CNC Machine— Arduino, SOLIDWORKS
Led the design, programming, and implementation of a custom CNC machine for precision manufacturing. [Video Link]
Collaborative 2 DoF Robotic Arms: Team-Based Design and Implementation using SOLIDWORKS, Python, Raspberry Pi
[GitHub Link]

Publications

A Review of Visual SLAM for Robotics: Evolution, Properties, and Future Applications
Frontiers in Robotics and AI
Design and Analysis of a Four DoF Robotic Arm with Two Grippers for Agriculture
IJAMEC

Awards and Competitions

TÜBİTAK 2209-A Program – Government-funded support for Bachelor's Graduation Project (2019).
Climatelaunchpad International Competition – Finalist with a hydroponic system project (2020).
Bina Incubator Competition – Ranked top 8 with a hydroponic system project (2020).

Languages

Arabic – Native
English – Advanced
Turkish – Advanced
German – Beginner

Volunteering and Leadership

Developer Engineer @ Yemeni Engineers Team (2020) – Designed mechanical ventilators for COVID-19 patients.
President @ Yemeni Student Union Association (2019) – Elected by students across 52 universities in Izmir.
International Coordinator @ Izmir Maker Fair (2018) – Represented international companies at exhibitions.