MOHAMMED ALASHKAR

ROBOTICS SOFTWARE ENGINEER | MECHATRONICS STUDENT

CONTACT

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LANGUAGES

- English: B2 (Intermediate-Advanced)
- Arabic: Native

PROFESSIONAL SUMMARY

I am a dedicated Robotics Software Engineer and Mechatronics student with extensive hands-on experience in developing and programming autonomous robots. I specialize in robot control, computer vision, IoT integration, and advanced robotics techniques, including navigation and mapping, using platforms such as ROS (Robot Operating System) and Arduino. Experienced in designing autonomous navigation systems, integrating sensors, actuators, and real-time robotics applications. Proficient in various programming languages such as C++, Python, and C. Skilled in 3D modeling and mechanical design using SOLIDWORKS, with strong knowledge of simulation tools like Gazebo and RViz. Passionate about solving complex challenges in robotics and automation and continuously learning to push the boundaries of robotics technology.

TECHNICAL SKILLS

- **Programming Languages**: C++, Python, C, Shell Scripting
- **Robotics & ROS:** ROS, ROS Controllers, SLAM, Path Planning, Navigation, Localization, Gazebo, RViz, XACRO, URDF
- **IoT:** IoT Integration, Remote Robot Control
- **Computer Vision:** OpenCV, Object Detection, Visual Navigation
- **Software & Tools:** SOLIDWORKS, Gazebo, RViz, Arduino IDE, Visual Studio Code, Ubuntu Linux
- **Electronics:** Sensors, Actuators, Embedded Systems, Circuit Design
- **Algorithms & Datatructures:** Problem-Solving, Algorithm Optimization
- **3D Modeling**: Skilled in SOLIDWORKS for 3D modeling and design of mechanical components

SOFT SKILLS

- **Communication:** Strong interpersonal and presentation skills
- **Problem-Solving:** Analytical thinking and troubleshooting of complex systems
- **Teamwork**: Collaborative work experience in multidisciplinary teams

EDUCATION

Bachelor of Mechatronics Engineering

Alexandria Higher Institute of Engineering and Technology

Expected Graduation Year: 2027

CERTIFICATIONS

- **Robotics Certificate | Smart Technology**   **2023**
- This course provided me with the foundational skills needed to build and program basic robotic systems using Arduino. Topics covered included robotics principles, sensor integration, actuators, and basic programming concepts. The hands-on projects allowed me to solidify my understanding of robotics in a practical environment.
- **Key Takeaways:**
  - Built and programmed simple robots using Arduino.
  - Gained hands-on experience with sensors and actuators in robotics.
  - Strengthened foundational knowledge of robotics design and implementation.
- **Robotics for Professionals | Robotics Corner**   **2024**
- In this course, I learned ROS from scratch, focusing on the fundamentals and advanced concepts of ROS development. I gained expertise in creating ROS nodes, working with ROS topics, services, and actions, as well as understanding ROS packages. The course also covered ROS integration with sensors and actuators for controlling robots. I learned to build complex autonomous robots, incorporating computer vision, path planning, and localization.
- **Key Takeaways:**
  - Mastered ROS fundamentals including nodes, topics, services, and actions.
  - Learned to develop complex autonomous robots using ROS integration.
  - Gained hands-on experience in robot control, sensor integration, and actuator management.
- **Participation Certificate | ISEIC 2024 & ITC IEEE 2024**   **2024**
- Participated in the International Smart Engineering and Innovative Conference (ISEIC 2024) and ITC IEEE 2024, which focused on the design and implementation of robotic systems. During these events, I enhanced my knowledge of cutting-edge robotics technologies, worked with interdisciplinary teams, and presented innovative solutions for robotic applications.
- **Key Takeaways:**
  - Enhanced skills in collaborative problem-solving.
  - Gained insights into robotics technologies and their real-world applications.
  - Developed the ability to work in multidisciplinary teams.

PROJECTS AND WORK EXPERIENCE

- **4-Wheel Autonomous Robot:**
  - Developed a fully functional 4-wheel autonomous robot using ROS for navigation and mapping. The robot uses LIDAR sensors for mapping the environment and integrates with SLAM (Simultaneous Localization and Mapping) algorithms to navigate autonomously.
- **Key Takeaways:**
  - Gained hands-on experience with autonomous navigation and SLAM.
  - Integrated LIDAR and other sensors for real-time robot mapping.
  - Enhanced skills in developing ROS-based autonomous robots and path planning.
- **Ground Reconnaissance Vehicle:**
  - Designed and built a Bluetooth-controlled ground reconnaissance vehicle using Arduino. This vehicle was used for ground surveillance and remote operation, and I integrated sensors to monitor environmental factors.
- **Key Takeaways:**
  - Built and programmed a Bluetooth-controlled robot with Arduino.
  - Gained experience with sensor integration for environmental monitoring.
  - Enhanced skills in remote control and surveillance robotics.
- **Environmental Car Exhaust System:**
  - Built a system to reduce harmful gases using Arduino, ozone generators, and hydrogen-based filtration. The system was designed for environmental conservation by treating car exhaust and air pollution before it is released into the atmosphere.
- **Key Takeaways:**
  - Integrated various environmental sensors and gas reduction systems.
  - Designed a practical solution for reducing harmful car exhaust emissions.
  - Gained experience in environmental conservation through robotics.
- **Obstacle Avoidance Robot:**
  - Designed and developed an obstacle avoidance robot using Arduino and ultrasonic sensors. The robot detects obstacles in its path and autonomously changes direction to avoid collisions.
- **Key Takeaways:**
  - Gained practical experience with ultrasonic sensors and obstacle avoidance.
  - Developed an autonomous robot capable of real-time decision-making.
  - Improved skills in sensor-based robot navigation and control.
- **Robotic Arm:**
  - Created an industrial robotic arm controlled by Arduino. The arm was programmed for simple automation tasks, such as object picking and placement, and demonstrated the integration of various actuators and sensors for precise movement.
- **Key Takeaways:**
  - Developed an automated robotic arm for industrial applications.
  - Integrated actuators and sensors for precise control.
  - Gained experience in robotics programming and mechanical automation.
- **Line Follower Robot:**
  - Developed a line-following robot using infrared (IR) sensors and Arduino. The robot can autonomously follow a predefined path by detecting and following a black line on a white surface.
- **Key Takeaways:**
  - Built and programmed a line-following robot with IR sensors.
  - Learned to implement simple algorithms for autonomous path-following.
  - Enhanced skills in sensor-based robotics and algorithm development.