

Profile

I am a Robotics Engineer with over a decade of extensive experience in mechanical analysis and software development for robotics applications. Throughout my career, I have held several positions where I designed and developed a wide range of robots, including industrial-grade 6DOF serial manipulators, 2500kg Stewart platforms, and mobile construction excavators. Most of the products I was involved in were designed as commercial products with tight deadlines resulting in successful, profitable products. I have also demonstrated my ability to manage robotics teams, as seen in my previous role as robotics team manager at Hamgar Toos. My enthusiasm, professionalism, expertise, and experience in both mechanical and software development make me a valuable resource for your company.

Experience

- | | |
|---|---|
| Senior Robotics Engineer
BHF Solutions Inc. - (2024-now)
bhfolution.com | <ul style="list-style-type: none">➤ Lead a team of Mechanical and Software engineers to develop, prototype, and test a custom autonomous platform with embedded Delta robot to eradicate weeds.➤ Implemented a real-time application using embedded systems to control the Delta robot and the machine.➤ Included RGB-D cameras, LiDAR, and IMU for local and global path planning and localization.➤ Utilized CUDA programming to accelerate the control algorithms.➤ Tested, and validated the performance of the developed algorithm on the actual hardware containing a Jetson series Hardware and Industrial PC.➤ Successfully developed a custom application platform including software development, testing, calibration, validation, and mechanical analysis throughout the field tests.➤ Designed a custom application machine to increase the efficiency of the system by combining the software, and hardware capabilities. |
| Mechatronic Engineer
Halo Beauty Co. - (2023-2024)
halobraid.com | <ul style="list-style-type: none">➤ Engineered a microactuator to automate the hair-grabbing process, improving braiding quality and efficiency.➤ Led mechanical design for R&D and created detailed manufacturing drafts, preparing the actuator for mass production. |
| Research Assistant
AVEC Lab - (2021-now)
avec-lab.com | <ul style="list-style-type: none">➤ Developed real-time applications in C++ on dSpace embedded controllers for autonomous mobile excavators.➤ Designed a perception algorithm combining LiDAR and depth camera data using PCL and OpenCV for environmental analysis.➤ Created a ROS2 package enabling visualization, monitoring, and control of excavator operations.➤ Built a custom GUI with OpenGL for UDP-based communication, supporting extensive excavator control.➤ Developed a Python-based route optimization program, enhancing efficiency in obstacle-filled environments. |
| Engineering Team Manager
C1-Tech - (2017-2021)
c1tech.co | <ul style="list-style-type: none">➤ Designed an automation panel for operating rooms, enabling centralized control over temperature, lighting, humidity, curtains, and intercom systems.➤ Marketed and installed the panel in seven hospitals, covering over 60 operation rooms. |
| Robotics Team Manager
Hamgar Toos Co. - (2016-2018)
en.hamgartoos.com
FUM Robotics Lab - (2012-2016)
fum-care.com | <ul style="list-style-type: none">➤ Led a team of 10 engineers in developing real-time software systems for industrial robots, covering motion generation, I/O control, and program parsing.➤ Developed C++ software on Beckhoff controllers for robots like FUM-6R-20 and FUM-SCARA-V2.➤ Conducted kinematic and dynamic analysis, validated simulations, and optimized motion planning using SolidWorks Motion, Simulink, and MATLAB.➤ Implemented vision-based calibration processes and communication protocols (CANOpen, EtherCAT, Profibus, RS-485) for servo drive control. |
| CEO and Co-Founder
Mutau Co. - (2008-2012)
mutau.ir | <ul style="list-style-type: none">➤ Drove revenue growth by exploring new markets and expanding product offerings.➤ Led R&D to create an advanced 3D printer model, positioning the company as a rising industry leader.➤ Enhanced employee satisfaction and operational efficiency, achieving notable production cost savings. |

Skills

Technical Skills

C/C++	★★★★★
ROS2	★★★★★
Embedded Systems	★★★★★
SolidWorks	★★★★★
Linux	★★★★☆
Git	★★★★☆

Technical Skills

MATLAB	★★★★★
Simulink	★★★★★
Python	★★★★★
CUDA	★★★★☆
OpenGL	★★★★☆

Soft Skills

Teamwork	★★★★★
Creative Thinking	★★★★★
Project Management	★★★★★
Leadership	★★★★★
Strategic Planning	★★★★☆

Education

Ph.D. in Mechanical Engineering
OntarioTech University - (2021-now)

➤ Autonomous excavators on construction sites. Perception, control, motion-planning, and safety.

M.Sc. in Mechanical Engineering
Ferdowsi University - (2010-2013)

➤ A real-time method to calculate the inverse dynamics equations of a three DOF parallel 3-PSP robot.

B.Sc. in Mechanical Engineering
Islamic Azad University - (2007-2009)

➤ Developed a multi-DOF four-bar mechanism to follow the desired trajectory.

Publications and Patents

Automation in Construction - (2024)
Agriculture - (2022)

➤ RGB-LiDAR sensor fusion for dust de-filtering in autonomous excavation applications
➤ Optimal Path Generation with Obstacle Avoidance and Subfield Connection for an Autonomous Tractor

1st IECMA - (2022)

➤ A real-time estimation method of soil-bucket interaction of an autonomous excavator via marching cube and constructive solid geometry methods

8th ECSA - (2021)

➤ Collaborative tracking control strategy for autonomous excavation of a hydraulic excavator

8th ECSA - (2021)

➤ Surface Reconstruction for Ground Map Generation in Autonomous Excavation

5th ICRoM - (2017)

➤ Explicit Inverse Kinematic Solution for the Industrial FUM Articulated Arm using Dual Quaternion Approach

AMM - (2015)

➤ Effect of Link Tolerance and Joint Clearance on End-Effector Positioning of the 3-PSP Manipulator Using Taguchi Method

Patent - (2012)

➤ Design a 3-Axis CNC with Laser CMM Ability