HAMED BAGHERI

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About

Senior robotics electronics engineer with over a decade of experience designing and developing embedded electronic systems, firmware, and system-level hardware for advanced robotic platforms. Background spans exoskeleton and medical robotics, embedded hardware design, real-time communication systems, power and battery systems, sensor integration, system validation, and safety-critical documentation. Experienced in leading electronics development, collaborating with multidisciplinary engineering teams, and delivering reliable robotic systems from concept through integration, testing, and deployment.

Education

Master of Science in Mechatronic Systems Engineering *Simon Fraser University*
Master's degree program
Thesis: Vision-Based Environmental Perception for Lower-Limb Robotic Exoskeletons

Master of Science in Electrical Engineering *Qazvin Islamic Azad University*
Master's degree program
Thesis: Vision-Based Path Planning for a Manipulator of an Urban Search and Rescue Robot

Bachelor of Science in Electrical Engineering *Qazvin Islamic Azad University*
Bachelor's degree program
Final project: Power Management System for an Autonomous Service Robot

Work Experience

Human in Motion Robotics Inc. ***Aug 2023 – Present***
Senior Electronic Engineer *Vancouver, BC, Canada*

- Led the design and development of embedded electronic systems for a lower-limb robotic exoskeleton, including custom PCBs, power architecture, and high-speed circuitry.
- Developed real-time embedded firmware and low-level control solutions for hardware integration and distributed robotic subsystems.
- Designed and integrated real-time communication architectures based on EtherCAT, CAN, SPI, and I^2C for synchronized robotic operation.
- Developed embedded communication frameworks enabling deterministic control and 1 ms-level real-time performance across distributed robotic subsystems.
- Developed power distribution, battery management, monitoring, and protection solutions for high-power robotic systems.
- Designed power electronics architectures supporting regenerative power handling and dynamic load operation.
- Integrated sensing, motor-drive interface, and embedded electronic subsystems within a distributed robotic platform.
- Performed hardware bring-up, prototyping, debugging, and system-level integration across multiple embedded platforms.
- Conducted validation and performance verification activities to support system reliability and operational robustness.
- Developed embedded electronic systems in accordance with medical device, EMC, and functional safety requirements.
- Supported compliance-driven design activities, verification processes, and technical documentation for safety-critical robotic systems.

Simon Fraser University ***Sep 2021 – Jun 2023***
Graduate Research Assistant *Vancouver, BC, Canada*

- Focused on vision-based environmental perception for lower-limb robotic exoskeletons, targeting real-time terrain understanding and safe user interaction.
- Developed and implemented machine learning models for terrain classification, enabling detection of level ground, ramps, and staircases.
- Applied depth sensing and point cloud processing to extract reliable environmental features for assistive robotics applications.
- Integrated sensor-fusion techniques to improve system robustness in real-world operating conditions.
- Contributed to the development and validation of a real-time perception pipeline for wearable robotic mobility systems.

Advanced Mobile Robotics Laboratory (AMRL), SYNTECH ***Jul 2017 – Sep 2021***
Team Leader *Qazvin, Iran*

- Led a multidisciplinary team in the development of autonomous and teleoperated robotic systems for rescue, inspection, and hazardous-environment applications.
- Managed the design, integration, and deployment of mobile robotic platforms featuring advanced mobility, dexterous manipulators, and real-time sensing capabilities.
- Supervised the implementation of motion planning, path optimization, and sensor fusion to support robotic perception and autonomous decision-making.
- Coordinated cross-functional collaboration across mechanical, electronics, and software teams to support system development and operational performance.
- Directed the development of embedded hardware, PCB design, and high-speed communication interfaces for real-time robotic systems.
- Led testing, validation, and field deployment activities to ensure operational reliability and robustness in complex environments.

Advanced Mobile Robotics Laboratory(AMRL), SYNTECH ***Aug 2015 - Sept 2017***
Electronic Group Team Lead *Qazvin, Iran*

- Led the design and development of embedded electronic systems, including custom hardware, PCB design, and embedded firmware solutions.
- Managed electronic system development activities from architecture and prototyping through debugging, validation, and deployment.
- Directed hardware integration, embedded system development, and communication interface implementation for real-time electronic platforms.
- Coordinated cross-functional engineering activities across electronics, embedded systems, and system integration efforts.
- Supported technical documentation, testing, and verification activities for embedded electronic systems.

Service Robot Lab, Mechatronic Research Lab, Syntech ***Jan 2011 - Aug 2015***
Electronic Engineer and Firmware Developer *Qazvin, Iran*

- Designed and developed embedded electronic systems for autonomous mobile robotic platforms, including power management, battery monitoring, and embedded control systems.
- Developed custom hardware, PCB designs, and embedded firmware solutions based on AVR and ARM microcontrollers.
- Implemented battery management and power selection architectures for mobile robotic applications.

- Developed embedded communication and networking solutions over Ethernet and serial communication interfaces.
- Supported robotic system integration activities involving navigation, sensing, and mobile manipulation platforms.
- Contributed to robotics research and development initiatives within RoboCup @Home autonomous robotics projects.

Pasdaran Robotic Team ***Mar 2008 – Mar 2010***
Electronic Designer *Qazvin, Iran*

- Designed and built electronic hardware and firmware for line-follower robotic systems.
- Supported PCB design, sensor integration, firmware development, testing, and troubleshooting activities.

Publications

[1]. F. Najafi, H. Bagheri, N. Bonakdar, A. Pouryayvali, M. Ahadi, and M. Mojahedpour, "Team Description Papers of Rescue Robots," in Proceedings of the International Symposium of RoboCup, Sydney, Australia, 2019.

[2]. R. Fathzadeh, V. Mokhtari, F. Abazari, F. Abdollahi, N. Nabavi, and H. Bagheri, "Mobile Robot in Domestic Environment," IEEE, Apr. 2014.

[3]. F. Najafi, M. Dadvar, S. Habibian, A. Hosseini, H. Haeri, M. Arvan, B. Peykari, and H. Bagheri, "Team Description Papers of Rescue Robots," in Proceedings of the International Symposium of RoboCup, Montreal, Canada, 2018.

[4]. F. Najafi, M. Dadvar, S. Habibian, A. Hosseini, H. Haeri, M. Arvan, B. Peykari, and H. Bagheri, "Team Description Papers of Rescue Robots," in Proceedings of the International Symposium of RoboCup, Nagoya, Japan, 2017.

[5]. F. Najafi, M. Dadvar, S. Habibian, A. Hosseini, H. Haeri, M. Arvan, B. Peykari, and H. Bagheri, "Team Description Papers of Rescue Robots," in Proceedings of the International Symposium of RoboCup, Leipzig, Germany, 2016.

[6]. R. Fathzadeh, F. Abdollahi, N. Nabavi, F. Abazari, H. Bagheri, R. Shahabian, J. Zahedi, R. Ahmadi, and B. Ghiasvand, "Team Description Papers of @Home Robots," in Proceedings of the International Symposium of RoboCup, Joao Pessoa, Brazil, 2014.

Technical Skills

Robotics & Systems	Robotics electronics, embedded system design, system integration, validation, verification, troubleshooting, and multidisciplinary engineering collaboration.
Electrical Hardware	Analog and digital design, schematic capture, PCB design, power electronics, battery systems, sensor interfaces, high-speed circuitry, EMC-aware design, Altium 365, and LTspice.
Embedded Systems	Embedded firmware, ARM microcontrollers, real-time embedded systems, EtherCAT, CAN, Ethernet, SPI, I^2C, UART, USB, ADC, and DMA-based acquisition.
Software & Tools	C, C++, Python, Verilog, LaTeX, Windows, Linux, and Robot Operating System (ROS).
Medical Robotics	Medical device development exposure, functional safety, EMC, fault monitoring, technical documentation, and compliance-driven design activities.

Honors and Awards

- **4th Place**, Rescue Robot League, World RoboCup Competitions, Sydney, Australia, 2019.

- **1st Place**, Rescue Robot League, Asian RoboCup Competitions, Kish, Iran, 2019.

- **2nd Place**, Rescue Robot League, World RoboCup Competitions, Montreal, Canada, 2018.

- **1st Place**, Rescue Robot League, Asian RoboCup Competitions, Bangkok, Thailand, 2018.

- **3rd Place**, Rescue Robot League, World RoboCup Competitions, Nagoya, Japan, 2017.

- **2nd Place**, Rescue Robot League, World RoboCup Competitions, Leipzig, Germany, 2016.

- **Best-in-Class Exploration Award**, Rescue Robot League, World RoboCup Competitions, Leipzig, Germany, 2016.

- **1st Place**, Rescue Robot League, World RoboCup Competitions, Hefei, China, 2015.

- **Innovative User Interface Award**, Rescue Robot League, World RoboCup Competitions, Hefei, China, 2015.

- **6th Place**, Rescue Robot League, World RoboCup Competitions, Joao Pessoa, Brazil, 2014.

- **Multiple 1st Place Awards**, Rescue Robot League, Iran Open RoboCup Competitions, Tehran, Iran, 2012–2018.

Language Proficiencies

English	Professional working proficiency
Persian	Native