
Hesamodin Abdoli

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Tehran, Iran

Profile

M.Sc. graduate in Electrical Engineering (Power Electronics) with over five years of academic, industrial, and teaching experience. Deep expertise in multilevel inverters, solid-state transformers, control methods for power converters, and real-time implementation. Proficient in MATLAB/Simulink, dSPACE, Opal-RT, and embedded systems. Highly motivated to pursue a Ph.D. focused on hybrid energy storage systems and intelligent power conversion.

Education

M.Sc. in Electrical Engineering – Power Electronics and Machines

Amirkabir University of Technology, Tehran, Iran

GPA: 3.87/4.0 (16.71/20)

Thesis: "Structural Improvement of Solid-State Transformer based on Multilevel Inverter Applying and New Modulation Pattern Utilization" (20/20)

Supervisors: Dr. Javad Shokrollahi Moghani, Prof. Sadegh Vaez-Zadeh

2018 – 2021

B.Sc. in Electrical Engineering – Electronics

Shiraz University of Technology, Shiraz, Iran

GPA: 14.76/20

Final Project: "Design and Implementation of Seven-level Inverter" (20/20)

2014 – 2018

- Guest student at **Iran University of Science and Technology (IUST)** for 5 semesters (3rd to 7th), Tehran, Iran

Research Interests

Solid-State Transformers, DC-DC Converters, Multilevel Inverters, Energy Storage Systems (ESS), Battery Management Systems (BMS), Photovoltaic Applications

Publications

1. H. Abdoli, A. Khorsandi, B. Eskandari, and J. S. Moghani, "A New Reduced Switch Multilevel Inverter for PV Applications," *PEDSTC*, 2020. DOI: [DOI: 10.1109/PEDSTC49159.2020.9088508](https://doi.org/10.1109/PEDSTC49159.2020.9088508)
2. B. Eskandari, J. Kyra, and H. Abdoli, "Multiphase Multipurpose High Power Variable Speed Drive: Design and implementation," *PEDSTC*, 2020. DOI: [DOI: 10.1109/PEDSTC49159.2020.9088361](https://doi.org/10.1109/PEDSTC49159.2020.9088361)
3. H. Abdoli, J. S. Moghani, S. Vaez-Zadeh, A. Babaki, A. Jafari, J. Rodriguez, "Multilevel Inverter with a New Modulation Method Applied to Solid-State Transformer in PV Applications," *IECON*, 2021. DOI: [DOI: 10.1109/IECON48115.2021.9589746](https://doi.org/10.1109/IECON48115.2021.9589746)
4. A. Eikani, M. Amirkhani, H. Jafari, H. Abdoli, S. Vaez-Zadeh, G. Rezazadeh, "Robust Wireless Power Transfer by Self-Oscillating Controlled Inverter and Double-D Pads," *ICEE*, 2024. DOI: [DOI: 10.1109/ICEE63041.2024.10667708](https://doi.org/10.1109/ICEE63041.2024.10667708)
5. H. Abdoli, G. Rezazadeh, J. S. Moghani, S. Vaez-Zadeh, "A Novel AM Modulation Technique for Solid-State Transformers with Reduced Conversion Stages and Enhanced Efficiency." *Scientia Iranica Journal*, submitted, under review.

Professional Experience

- R&D Manager – Lian Battery Co., Tehran** Feb 2025 – Present
Serving as R&D Manager overseeing cross-functional teams in mechanics, software, and electronics. Responsible for defining control and monitoring algorithms, supervising the software team, and performing code debugging. Leading the hardware design of a next-generation BMS, focused on addressing prior design issues and integrating enhanced features.
- Technical Manager – ELECTRIKALA Group, Tehran** Oct 2022 – Feb 2025
Supervised the development of industrial power drive systems, including a 45 kW inverter for heavy-duty applications. Directed technical team and system validation.
- Military Service – National Elite Foundation** Oct 2022 – Dec 2024
Completed alternative military service as a recognized elite member through the National Elite Foundation. Engaged in the design and development of a 45 kW industrial drive for induction motors.
- R&D Engineer – Lian Battery Co., Tehran** Sep 2021 – Oct 2022
Worked as an R&D engineer focused on the design and development of BMS hardware. Responsibilities included electronic circuit design, simulation, and PCB layout and implementation using Altium Designer.
- Electrical Engineer – ELECTRIKALA Group** Jun 2018 – Sep 2019
Engaged in the installation of numerous industrial and residential drive systems. Designed a multiphase multipurpose motor drive and an IGBT driver board.
- Internship – IoT Academy, Tehran** Jun – Sep 2017
Participated in the development of an intelligent parking system. Responsibilities included designing the client-server communication platform between sensors and the central server, developing user-side booking applications, and designing necessary PCBs for system integration.
- Technician – Motor Control Co., Tehran** Jun 2016 – Sep 2017
Performed testing, troubleshooting, and commissioning of induction motor drives. Tasks included drive repair, tuning, and field setup in various industrial applications.

Research Experience

- Research Assistant – University of Tehran (Automotive Energy and Electronics (Electric, Hybrid, and Solar Vehicles), Dr. Reza Zadeh)** 2021 – Present
Conducting research in the fields of electric vehicles, solid-state transformers, and DC-DC power converters. Involved in simulation, modeling, and control strategy development for power electronic systems.
- Research Assistant – University of Tehran (Wireless Power Transfer Lab, Prof. Vaez-Zadeh)** 2018 – 2020
Worked on solid-state transformer topologies and simulation of modulation strategies in PV systems.
- Research Assistant – Amirkabir University of Technology (Power Electronics Lab, Prof. Moghani)** 2018 – 2020
Worked on Multilevel Inverters topologies PV systems.

Teaching Assistant

- University of Tehran:** Electric Vehicles (Fall 2023), Electric Machines II (Fall 2023), Power System Analysis I (Fall 2020 and Spring 2021)
- K. N. Toosi University of Technology:** Electric Machines I (Fall 2022 and Spring 2023), Electric Machines III (Fall 2022)

Projects

- Design, simulation and implementation of:
- A 45kW inverter for high-performance industrial use
 - A Solid-state Transformer with a new modulation method

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- A multi-phase multipurpose motor drive
 - A 7-level inverter for PV applications
 - A Battery Management System (BMS) for lithium batteries

Design and simulation of:

- An Optic Detection Circuit
- A Control Circuit for Buck Converter
- A Network-Connected 3-phase 2-level Inverter
- A Five-level Inverter for Injecting the Real Power of Renewable Power into the Grid
- A Induction Motor and Synchronous Motor Systems
- A PM Motor System and a Control Unit of a PMSM Drive System

Technical Skills

Software: MATLAB, Simulink, Altium Designer, OrCAD, Proteus, ANSYS Maxwell, SolidWorks

Programming: Python, C++, Arduino, KEIL, CodeVisionAVR

Specialties: Converter control, Real-time simulation, Embedded systems, PCB design

Languages

Persian (Native), English (B2 - Upper-Intermediate Level)

Certifications

- Introduction to Power Electronics Coursera Course (2022)
- PEDSTC2020 Certificate (2020)
- ARM Cortex-M Microcontroller Training (2018)
- IEEE FPGA Workshop - IUST Robotics Lab (2016)

References

Dr. Javad Shokrollahi Moghani - moghani@aut.ac.ir

Dr. Ghasem Rezazadeh - g.rezazadeh@ut.ac.ir

Dr. bahman Eskandari - bahman.eskandari@kone.com