

OMID RAJABI SHISHVAN

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EDUCATION

University at Albany, State University of New York 2016-2022
Ph.D. in Electrical and Computer Engineering

- Advisor: Gary J. Saulnier, Ph.D.
- Dissertation Title:

*ACT5 EIT System:
A Multiple-Source Electrical Impedance Tomography System*

University of Rochester 2012-2015
M.Sc. in Electrical Engineering

Sharif University of Technology 2007-2012
B.Sc. in Electrical Engineering

RESEARCH EXPERIENCE

Postdoctoral Researcher 2022 - Present

- Improving the performance of the ACT5 EIT System

Graduate Student Research Assistant 2019 - 2022

- Design and implementation of the architecture and the digital components of ACT5 EIT system. The ACT5 system is an electrical impedance tomography system for medical imaging. The project components include GUI written in MATLAB on PC, various hardware components using FPGAs, and the communication links in the system and between the system and the PC.

Graduate Student Research Assistant 2016 - 2019

Breakthrough Interactive Thinking Systems Lab

- Explored the possibilities of applying machine intelligence in healthcare applications, especially using deep learning techniques on analyzing electrocardiogram recordings of newborn babies.

Graduate Student Research Assistant 2012 - 2016

Advanced Computer Architecture Lab

- Explored methods on improving power delivery on processors. Explored alternatives to conventional packet delivery methods on a multi-core processor architecture.

TEACHING EXPERIENCE

Laboratory and/or Teaching Assistant for **Introduction to Circuits, Systems Analysis and Design, Programming for Engineers, Introduction to Engineering Design, Introduction to Engineering Analysis, Circuits and Signals, Advanced CMOS VLSI Design, Advanced Digital Design Using FPGA, Microprocessor Systems Lab, Microprocessor Systems Design, Logic Circuits**

PUBLICATIONS

Journal/Magazine Articles

- **O. Rajabi Shishvan**, A. Abdelwahab, N. Barbosa da Rosa Jr., G. J. Saulnier, J. L. Mueller, J. C. Newell, and D. Isaacson. ACT5 electrical impedance tomography system. *IEEE transactions on biomedical engineering*, 2023

- S. J. Hamilton, P. A. Muller, D. Isaacson, V. Kolehmainen, J. Newell, **O. Rajabi Shishvan**, G. Saulnier, and J. Toivanen. Fast absolute 3D CGO-based electrical impedance tomography on experimental tank data. *Physiological Measurement*, 43(12):124001, 2022
- G. J. Saulnier, A. Abdelwahab, and **O. Rajabi Shishvan**. DSP-based current source for electrical impedance tomography. *Physiological Measurement*, 41(6):064002, 2020
- H. Habibzadeh, K. Dinesh, **O. Rajabi Shishvan**, A. Boggio-Dandry, G. Sharma, and T. Soyata. A survey of Healthcare Internet of Things (HIoT): A clinical perspective. *IEEE Internet of Things Journal*, 7(1):53–71, 2019
- **O. Rajabi Shishvan**, D. S. Zois, and T. Soyata. Machine intelligence in healthcare and medical cyber physical systems: A survey. *IEEE Access*, 6:46419–46494, 2018

Conference Publications

- **O. Rajabi Shishvan**, N. Barbosa da Rosa Junior, G. J. Saulnier, J. Mueller, J. C. Newell, and D. Isaacson. Preliminary human-subject results of ACT5 EIT system. In *23rd International Conference on Biomedical Applications of Electrical Impedance Tomography (EIT2023)*, 2023
- C. Wilcox, N. Barbosa da Rosa Junior, J. Mueller, J. C. Newell, G. J. Saulnier, **O. Rajabi Shishvan**, and D. Isaacson. Total cardiac vector reconstruction using EIT and ECG data. In *23rd International Conference on Biomedical Applications of Electrical Impedance Tomography (EIT2023)*, 2023
- A. Abdelwahab, **O. Rajabi Shishvan**, and G. J. Saulnier. A modified Howland current source design for simultaneous EIT/ECG data acquisition. In *International Conference of Bioelectromagnetism, Electrical Bioimpedance, and Electrical Impedance Tomography (ICBEM-ICEBI-EIT 2022)*, pages 208–211, 2022
- **O. Rajabi Shishvan**, A. Abdelwahab, and G. J. Saulnier. Practical Implementation of a Novel Output Impedance Measurement Technique for EIT System While Attached to a Load. In *2020 43rd Annual International Conference of the IEEE Engineering in Medicine & Biology Society (EMBC)*. IEEE, 2021
- **O. Rajabi Shishvan**, A. Abdelwahab, and G. J. Saulnier. ACT5 EIT system. In *21st International Conference on Biomedical Applications of Electrical Impedance Tomography (EIT2021)*, page 55, 2021
- A. Abdelwahab, **O. Rajabi Shishvan**, and G. J. Saulnier. A new method for simultaneous EIT/ECG data acquisition. In *21st International Conference on Biomedical Applications of Electrical Impedance Tomography (EIT2021)*, page 36, 2021
- **O. Rajabi Shishvan**, A. Abdelwahab, and G. J. Saulnier. Measuring current source output impedance in EIT systems while attached to a load. In *2020 42nd Annual International Conference of the IEEE Engineering in Medicine & Biology Society (EMBC)*, pages 1452–1456. IEEE, 2020
- A. Abdelwahab, **O. Rajabi Shishvan**, and G. J. Saulnier. Performance of an adaptive current source for EIT driving loads through a shielded coaxial cable. In *2020 42nd Annual International Conference of the IEEE Engineering in Medicine & Biology Society (EMBC)*, pages 1448–1451. IEEE, 2020

Book Chapters

- **O. Rajabi Shishvan**, D. S. Zois, and T. Soyata. Incorporating artificial intelligence into medical cyber physical systems: A survey. In *Connected Health in Smart Cities*, pages 153–178. Springer, 2020
- **O. Rajabi Shishvan** and T. Soyata. Deep learning using CUDA. In *GPU Parallel Program Development Using CUDA*, pages 425–437. Chapman and Hall/CRC, 2018
- H. Habibzadeh, **O. Rajabi Shishvan**, and T. Soyata. CUDA libraries. In *GPU Parallel Program Development Using CUDA*, pages 383–395. Chapman and Hall/CRC, 2018

Thesis

- **O. Rajabi Shishvan**. *ACT5 EIT System: a Multiple-Source Electrical Impedance Tomography System*. PhD thesis, State University of New York at Albany, 2022

INVITED TALKS

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- National Center for Adaptive Neurotechnologies, Albany, NY. April 2023

PROFESSIONAL SERVICES

- **Journal Referee:** IEEE Access (2018 - 2022), IEEE Internet of Things (2020), Journal of Computational Social Science - Springer (2019).
- **Conference Technical Reviewer:** Vehicular Technology Conference (VTC2019-Fall) (IEEE), Global Information Infrastructure and Networking Symposium (GIIS 2018) (IEEE).
- **Member:** The Institute of Electrical and Electronics Engineers (IEEE), IEEE Engineering in Medicine and Biology Society.

SKILLS AND EXPERTISE

- Programming and scripting languages: C/C++/Python/MATLAB/Linux Bash
- Digital hardware design using Verilog HDL.
- FPGA Design using Xilinx Vivado
- Proficient in machine learning and deep learning applications.
- In-depth knowledge of architectural and power simulators including GEM5, McPAT, DRAMsim and SimpleScalar.

SELECTED COURSES

Artificial Intelligence I, Machine Learning, Probability and Random Processes, Detection and Estimation Theory, Digital Signal Processing, Information Theory, Quantum Information, Computation, and Foundations, Advanced Computer Architecture, Introduction to VLSI, Advanced Memory Systems, Multiprocessor Architectures, Stochastic Modeling of Computer Systems