

Ali Ramezani

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[LinkedIn](#) | [Google Scholar](#) Department of Anesthesiology, University of Utah
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Salt Lake City, Utah 84112, USA

Research Interests

Medical Device Design • Bioinstrumentation • Renal Oxygenation Monitoring & AKI Detection • Medical Imaging
• Signal Processing & Algorithm Design

Education

Ph.D. in Biomedical Engineering 2023 – Present

University of Utah, Salt Lake City, Utah, USA

CGPA: 3.98/4.00

Graduate Research Assistant, Anesthesiology Bioengineering Lab

Advisor: Professor Kai Kuck

M.S. in Biomedical Engineering (Biomechanics) 2014 – 2017

Islamic Azad University, Science and Research Branch, Tehran, Iran

CGPA: 18.31/20.00 (3.81/4.00) – *Ranked 1st*

Thesis: Design and construction of a novel automated and portable chest compression device in CPR

Advisor: Dr. Ali Tavakoli Golpaygani

B.S. in Biomedical Engineering (Biomechanics) 2010 – 2014

Islamic Azad University, Science and Research Branch, Tehran, Iran

CGPA: 16.63/20.00 (3.36/4.00), Junior/Senior GPA: 17.60/20.00 (3.62/4.00)

Project: 3D modeling and analysis of platelets movements in capillaries using CFD method

Advisor: Dr. Kamran Hassani

Research and Professional Experience

1. **Fellow, MIT Catalyst Program** 2026 – Present

Massachusetts Institute of Technology, Cambridge, MA

Participating in a translational research program focused on high-impact healthcare solutions

2. **Research Assistant** 2023 – Present

Anesthesiology Bioengineering Lab, University of Utah

Developing medical devices for monitoring kidney health and detecting Acute Kidney Injury (AKI)

3. **Construction Advisor, Designer, and Planner** 2020 – 2023

Hoveyda Food Industries, Zavieh Industrial zone, Iran

Led research, administrative work, office building design, and production line development

4. **Shareholder, Translator and Vice Chairman** 2009 – 2023

Brelyan Omid Trading Company, Hamedan, Iran

Import, distribution, and export of agricultural machinery spare parts

Publications

Published Journal Articles

1. **A. Ramezani**, N. A. Silverton, L. M. Saint-Pierre, G. L. Hoareau, and K. Kuck, "Correcting Diffusion Artifacts in Urinary Oxygen Tension Monitoring," *Scientific Reports*, 2026. doi: 10.1038/s41598-026-53461-z.
2. **A. Ramezani**, N. A. Silverton, K. Kuck, "Improving Urinary Oxygen Monitoring with a Transit Time Algorithm: Enhancing AKI Detection in Cardiac Surgery," *Journal of Clinical Monitoring and Computing*, 2025.
3. N. A. Silverton, L. R. Lofgren, K. Kuck, G. J. Stoddard, R. Johnson, **A. Ramezani**, and A. G. L. Hoareau, "Near-infrared spectroscopy for kidney oxygen monitoring in a porcine model of hemorrhagic shock, hemodilution, and REBOA," *Scientific Reports*, 14, 2646, 2024.
4. **A. Ramezani**, A. Tavakoli Golpaygani, and K. Hassani, "Design and Construction of a Novel Automated and Portable Chest Compression Device," *Modares Mechanical Engineering*, vol. 18, no. 01, pp. 258–264, 2018 [Persian].

Articles Under Review

1. **A. Ramezani**, K. Kuck, L. M. Saint Pierre, J. Morris, G. J. Stoddard, G. L. Hoareau, and N. A. Silverton, "Urine Oxygen-Guided Resuscitation in Porcine Hemorrhagic Shock," *Submitted to Anesthesiology*, 2026.
2. **A. Ramezani** (first author), J. Kim, N. A. Silverton, G. L. Hoareau, L. A. Howes, M. M. McFarland, N. Pace, and K. Kuck, "Risk Factors for Coronary Artery Bypass Graft Surgery-Associated Acute Kidney Injury: A Systematic Review and Meta-analysis (Protocol)," *Submitted to Cochrane Database of Systematic Reviews*, 2025.

Articles Ready for Submission

1. L. Lofgren, **A. Ramezani**, N. Silverton, K. Kuck, G. Hoareau, "The effects of administering isotonic crystalloid solution and norepinephrine during resuscitation on urinary oxygen concentration in a porcine hemorrhagic shock model."

Book Chapter

1. S.J. Masoumi, A. Tavakoli Golpaygani, and **A. Ramezani**, *Introduction to Telemedicine and Telesurgery*. Shiraz University of Medical Science, 2016 [Persian].

Conference Presentations

1. **A. Ramezani** et al., "Physics-Based Estimation of Bladder PuO_2 Improves AKI Discrimination After Cardiac Surgery," *ANESTHESIOLOGY® 2026 Annual Meeting*, San Diego, California, USA, October 2026. Accepted for presentation.
2. L. M. Saint-Pierre, N. A. Silverton, **A. Ramezani**, K. Kuck, H. S. Philp, J. Themen, K. Metzger, A. Taylor, A. M. Johnson, and G. L. Hoareau, "Prolonged Renal Cortical Hypoxia Correlates with Impaired Cortical Bioenergetics in a Swine Model of Hemorrhagic Shock and Resuscitation," *Shock Society 2026 Annual Conference*, Las Vegas, Nevada, USA, May 31–June 3, 2026.
3. **A. Ramezani**, N. A. Silverton, G. L. Hoareau, L. M. Saint-Pierre, and K. Kuck, "Diffusion-Corrected Urinary PO_2 Sensing for Bedside Renal Oxygen Monitoring," *Society for Technology in Anesthesia (STA) Annual Meeting*, Tampa, Florida, USA, January 2026.

4. **A. Ramezani** and K. Kuck, "Medistant: A Multi-Modal AI Assistant for Medical Device Identification and Guidance," *Society for Technology in Anesthesia (STA) Annual Meeting*, Tampa, Florida, USA, January 2026.
5. A. Kandukuri, **A. Ramezani**, and K. Kuck, "Rapid Gas-Phase Calibration of Fluorescence Quenching Urinary Oximeters," *Society for Technology in Anesthesia (STA) Annual Meeting*, Tampa, Florida, USA, January 2026.
6. N. A. Silverton, G. L. Hoareau, **A. Ramezani**, K. Kuck, "Noninvasive surrogates of kidney hypoxia in a porcine model of hemorrhage and resuscitation," *International Anesthesia Research Society (IARS) Annual Meeting*, Hawaii, USA, March 2025.
7. **A. Ramezani**, N. Silverton, and K. Kuck, "Urine Transit Time vs Flow-Based Models: An Approach to Assess Urine Sample Validity for AKI Detection," *STA 2025 Annual Meeting*, Tempe, Arizona, USA, January 2025.
8. **A. Ramezani**, N. Silverton, and K. Kuck, "Urine Transit Time Distribution in Cardiac Surgery Patients as a Window to Assess Acute Kidney Injury," *STA 2025 Annual Meeting*, Tempe, Arizona, USA, January 2025.
9. **A. Ramezani**, N. Silverton, and K. Kuck, "Tracking Urine Transit Time: A Laboratory-Validated Algorithm for Improved AKI Risk Assessment," *STA 2025 Annual Meeting*, Tempe, Arizona, USA, January 2025.
10. **A. Ramezani**, N. Silverton, and K. Kuck, "Tracking Urine Transit Time through Urinary Catheters to Enhance Renal Monitoring and Early Detection of Acute Kidney Injury Risk," *Utah Biomedical Engineering Conference 2024*, Salt Lake City, Utah, USA, September 2024.
11. **A. Ramezani** and K. Kuck, "Advanced Kidney Tissue Oxygenation Monitoring: A Potential Solution to Predict AKI Following Surgery," *STA 2024 Annual Meeting*, Houston, Texas, USA, January 2024.
12. H. Abdi, **A. Ramezani**, and A. Ehsani, "Head and Soccer Ball Models Development for Analyzing Soccer Heading Using Finite Element Method," *Second National Conference on New Researches in Sports Science*, Ardabil, Iran, 2017 [Persian].
13. H. Abdi, A. Ehsani, A. Bahmani, and **A. Ramezani**, "Finite Element Method of a Head Kick in Taekwondo Using by Experimental Results," *Second National Conference on New Researches in Sports Science*, Ardabil, Iran, 2017 [Persian].
14. **A. Ramezani**, A. Tavakoli Golpaygani, and MM. Movahedi, "Metrological Reliability and Electrical Safety: A Case Study on Electrosurgical Equipment," *XIV Mediterranean Conference on Medical and Biological Engineering and Computing 2016*, vol. 57, pp. 941–945, 2016.
15. A. Tavakoli Golpaygani and **A. Ramezani**, "Metrological Reliability and Electrical Safety: A Case Study on Defibrillator Equipment," *4th International Reliability Engineering Conference*, Tabriz, Iran, 2016 [Persian].
16. H. Abdi, **A. Ramezani**, and A. Tavakoli Golpaygani, "Design and Construction of a Novel Flexible Apparatus for Bleeding Stops in Vascular Angiography," *2nd National Conference on Novel Approaches of Biomedical Engineering in Cardiovascular Disease*, Tehran, Iran, 2016.
17. **A. Ramezani**, H. Abdi, and A. Tavakoli Golpaygani, "Design and Construction of a Novel Tube Feeding System for Patients by Using an Automatic Valve," *3rd International Congress of Critical Care*, Tehran, Iran, 2014 [Persian].
18. **A. Ramezani**, "Design and Construction of a Knee Stance Control Using Hydraulic Brake System," *11th National Congress of Orthosis and Prosthesis*, Tehran, Iran, 2014.

Patents

1. **International Patent Application Publication WO2026060269A1** (PCT; Pending) – Published Mar. 19, 2026
A. Ramezani, N. A. Silverton, K. Kuck, and G. L. Hoareau
"System and Method for Tracking Fluid Transit Time in a Conduit"
PCT/US2025/046194; claims priority to U.S. Provisional Patent Application No. 63/693,747
2. **U.S. Provisional Patent Application** (Filed) – Oct. 20, 2025
A. Ramezani, K. Kuck, N. A. Silverton, and G. L. Hoareau
"Diffusion Adjusted Sensor System and Method"
(Attorney Docket No. 105193-100)
3. **Iran Patent 111565** – Sep. 14, 2024
A. Ramezani and B. Ramezani
"Haptic Glove for Deeper Perception of Virtual Objects with Electromagnetic Locking Mechanism"
4. **Iran Patent 101615** – Feb. 23, 2020
A. Ramezani and MR. Parvizi
"Intelligent Monitoring and Assistive Device for Cardiopulmonary Resuscitation"
5. **Iran Patent 103282** – Apr. 13, 2020
A. Ramezani, B. Ramezani, and AH. Miremadi
"Smart Traffic Sign with Automatic Speed Adjustment and Remote Control Capability"
6. **Iran Patent 92688** – Jul. 04, 2017
A. Ramezani
"A Novel Automatic Apparatus for Chest Compression in CPR"
7. **Iran Patent 86918** – Sep. 27, 2015
A. Ramezani and H. Abdi
"Tube Feeding System for Patients by Using an Automatic Valve"
8. **Iran Patent 84007** – Oct. 01, 2014
A. Ramezani and M. Arazpour
"Knee Stance Control Orthosis Using Hydraulic Brake System"

Teaching Experience

1. **Teaching Assistant** – Bioinnovate I Spring 2026
University of Utah, Department of Biomedical Engineering
Instructors: Dr. Tomasz Petelenz and Dr. Alphonsus Ng
2. **Research Mentor** – Undergraduate Summer Internship Program Summer 2026
Anesthesiology Bioengineering Lab, University of Utah
Mentored undergraduate Biomedical Engineering students on medical device development and translational research projects.
3. **Research Mentor** – Undergraduate Summer Internship Program Summer 2025
Anesthesiology Bioengineering Lab, University of Utah
Mentored one undergraduate Biomedical Engineering student on medical device development and translational research.

4. **Research Mentor** – Undergraduate Summer Internship Program Summer 2024
Anesthesiology Bioengineering Lab, University of Utah
Mentored two undergraduate students (Biomedical Engineering and Medicine) on biomedical engineering research projects.
5. **Teaching Assistant** – Biomechanics Fall 2021
University of Social Welfare and Rehabilitation Sciences, Tehran, Iran
Instructor: Dr. Tabatabai Ghomsheh
6. **Workshop Instructor** – Computational Fluid Dynamics in Biomechanics Spring 2014
Islamic Azad University, Science and Research Branch, Tehran, Iran
ANSYS Software workshop for 5 students
7. **Teaching Assistant** – Orthoses and Prostheses Spring 2014
Islamic Azad University, Science and Research Branch, Tehran, Iran
Instructor: Dr. Arazpour
8. **Workshop Instructor** – Mechanical Design Using SolidWorks Fall 2013 – Winter 2014
Islamic Azad University, Science and Research Branch, Tehran, Iran
On-campus workshop for 5 students

Awards and Honors

1. **Canyon View Credit Union College Scholarship** 2026
Canyon View Credit Union
2. **MIT Catalyst Travel Award** 2026
Massachusetts Institute of Technology (MIT) Catalyst Program
3. **Engineering Challenge Award** 2026
Society for Technology in Anesthesia (STA)
4. **Best Trainee Award** 2026
Society for Technology in Anesthesia (STA)
5. **First Travel Award** 2026
Society for Technology in Anesthesia (STA)
6. **Member of Young Researchers Club** 2017
Islamic Azad University
7. **Ranked First Among All Master’s Students in Biomedical Engineering** 2016
Islamic Azad University, Science and Research Branch

Reviewer Experience

1. **Scientific Reports** – 1 manuscript reviewed 2025
2. **Journal of Clinical Nephrology and Research** – 1 manuscript reviewed 2025
3. **Signa Vitae** - Journal in Intensive Care and Emergency Medicine – 1 manuscript reviewed 2025

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| 4. JMIR Biomedical Engineering – 1 manuscript reviewed | 2025 |
| 5. Journal of Medical Internet Research – 1 manuscript reviewed | 2024 |

Service and Volunteer Work

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| 1. Co-founder, Iranian Utah Students Network
University of Utah – Built support network for 100+ Iranian students | 2023 – Present |
| 2. Arrival and Integration Volunteer
University of Utah and Salt Lake City Area – Airport pickups and orientation support | 2023 – Present |
| 3. Application Support Volunteer
Online – Reviewed 100+ CVs and personal statements for prospective students | 2022 – 2023 |

Professional Memberships

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| IEEE Graduate Student Member | 2025 – Present |
| IEEE Engineering in Medicine and Biology Society (EMBS) | 2025 – Present |
| Society for Technology in Anesthesia | 2023 – Present |
| Society of Manufacturing Engineering of Iran | 2018 – 2019 |
| Iranian Society of Mechanical Engineers | 2018 – 2019 |

Technical Skills

Specialized Software: SOLIDWORKS, FUSION 360, ANSYS, Abaqus

General Software: Microsoft Office, Adobe Photoshop

Electronics: Arduino/Microcontroller Programming, Circuit Design, Human Machine Interface

Programming: C/C++, Python, MATLAB

Other Skills: 3D Modeling, 3D Printing, Rapid Prototyping