

## Roozbeh Khodambashi Emami

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For project details and sample codes please visit my website: <https://rkhodambashi.github.io/>

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### EDUCATION

- Ph.D. in Systems Engineering, Arizona State University, *April 2021*
- M.S. in Music Technology, Georgia Institute of Technology, *May 2016*
- M.S. in Biomedical Engineering, Amirkabir University of Technology, *April 2008*
- B.S. in Mechanical Engineering, Shahrekord University, *April 2005*

### Ph.D. DISSERTATION

R. Khodambashi, "Soft Actuators for Miniature and Untethered Soft Robots Using Stimuli-responsive Hydrogels", Arizona State University, 2021. Committee: Daniel Aukes (chair), T. Sugar, C. Nam.

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### PUBLICATIONS, INTELLECTUAL PROPERTY, AND PRESENTATIONS

#### Journal Publications

1. Khodambashi, R., Alsaied, Y., Rico, R., Peet, M. M., Marvi, H., Fisher, R. E., Berman, S., He, X., Aukes, D. M., "Heterogeneous Hydrogel Structures with Spatiotemporal Reconfigurability using Addressable and Tunable Voxels". *Adv. Mater.* 2021, 2005906. <https://doi.org/10.1002/adma.202005906>. **Featured on the cover of the journal.**
2. Y. Alsaied, S. Wu, D. Wu, Y. Du, L. Shi, R. Khodambashi, R. Rico, M. Hua, Y. Yan, Y. Zhao, D. Aukes, X. He. "Tunable Sponge-like Hierarchically Porous Hydrogels with Simultaneously Enhanced Diffusivity and Mechanical Properties". *Adv. Mater.* 2021, 2010344. Accepted for publication.
3. A. Doroudchi, R. Khodambashi, M. Sharifzadeh, D. Li, S. Berman, D. Aukes Tracking Control of a Miniature 2-DOF Manipulator with Hydrogel Actuators", 2021, accepted for publication as a Submission for RA-L and RoboSoft in the IEEE Robotics and Automation Letters (RA-L).
4. Khodambashi R., Najarian S., Golpaygani A.T., Keshtgar A., (2008), "A Tactile Sensor for Detection of Skin Surface Morphology and its Application in Telemedicine Systems", *American Journal of Applied Sciences*, 5 (6): 633-638.
5. Mehrizi, A. A., Najarian, S., Khodambashi, R., & Dehkhoda, S. (2011). "A Novel Method of Tactile Assessment of Arteries Using Computational Approach". *International Journal of Academic Research*, 3(2).
6. Darvish, B., Najarian, S., Shirzad, E., & Khodambashi, R. (2009). "A novel tactile force probe for tissue stiffness classification". *American Journal of Applied Sciences*, 6(3), 512.

#### Refereed Conference Papers

1. R. Khodambashi, S. Berman, X. He and D. M. Aukes, "Miniaturized Untethered Soft Robots Using Hydrogel-based Soft Voxel Actuators" Proceedings of 4th IEEE International Conference on Soft Robotics (RoboSoft), April 12-16, 2021, Yale University, USA.
2. A. Doroudchi, R. Khodambashi, A. S. Lafmejani, D. M. Aukes and S. Berman, "Dynamic Modeling of a Hydrogel-based Continuum Robotic Arm with Experimental Validation," 2020 3rd IEEE International Conference on Soft Robotics (RoboSoft), New Haven, CT, USA, 2020, pp. 695-701.

3. Khodambashi, R., Weinberg, G., Singhose, W., Rishmawi, S., Murali, V., & Kim, E. (2016, November). "User oriented assessment of vibration suppression by command shaping in a supernumerary wearable robotic arm". In Humanoid Robots (Humanoids), 2016 IEEE-RAS 16th International Conference on (pp. 1067-1072). IEEE.
4. Khodambashi R., Najarian S., Golpaygani A.T., Dehkordi A., (2007), "A Model for Simulating the Mechanical Response of Fingertip to Tactile Stimuli", Proceedings of the 15th. Annual (International) Conference on Mechanical Engineering ISME2007, Amirkabir University of Technology (Tehran Polytechnic), Tehran, Iran.
5. Wang, N., Liu, R., Khodambashi, R., Asmare, N., & Sarioglu, A. F. (2017, January). "Code-division multiplexed resistive pulse sensor networks for spatio-temporal detection of particles in microfluidic devices". In MicroElectro Mechanical Systems (MEMS), 2017 IEEE 30th International Conference on (pp. 362-365). IEEE.
6. Sharifzadeh, Mohammad, Roozbeh Khodambashi, and Daniel M. Aukes. "An Integrated Design and Simulation Environment for Rapid Prototyping of Laminate Robotic Mechanisms." ASME 2018 International Design Engineering Technical Conferences and Computers and Information in Engineering Conference. American Society of Mechanical Engineers, 2018.

#### **Patents, Patent Applications, & Provisional Patents**

1. R. Khodambashi, Yousif Alsaied, Ximin He, Daniel Aukes, SHAPE MORPHING SOFT MATERIALS AND ASSEMBLIES INCLUDING THE SAME. US Patent Pending, Non-provisional Application filed June 2020.  
R. Khodambashi, A Darabi, Piezoelectric generator, method of its operation and its application in production, storage and transmission of electric energy, US Patent 10,505,471.
2. Gil Weinberg, R. Khodambashi, "A Wearable Robotic Limb", US Patent Pending, Application No. 62/258,571, GaTech invention disclosure reference number GTRC 7108.
3. R. Khodambashi, S. Najarian, "Tactile Device for Skin Lesion Detection", The Judiciary of Iran, Registration Number: 42618, 24th. September 2007.
4. R. Khodambashi, "Computer System for Studying Vibration Phenomenon for use in Mechanical Vibration Laboratories", The Judiciary of Iran, Registration Number: 43205, 9th. October 2007.

## **PROFESSIONAL ACTIVITIES AND SERVICE**

### **Peer Reviewer for Journals**

IEEE Robotics and Automation Letters (IEEE-RAL); Soft Robotics (SoRo); IOP Smart Materials and Structures (SMS); IOP Material Research Express (MRE); IOP Multifunctional Materials (MFM)

### **Peer Reviewer for Conferences**

International Conference on Robotics and Automation (ICRA); International Conference on Intelligent Robots (IROS); IEEE International Conference on Soft Robotics (RoboSoft)

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## MEMBERSHIPS AND AWARDS

- University Graduate Fellowship, 2019, Arizona State University.
- Ferdinand A. Stanchi fellowship, 2019, Arizona State University.
- Senator, Georgia Tech Graduate Student Government
- Top 10 entries among 1000+ in '2015 Create the Future Design Contest', NASA.
- Second Prize (500\$) for ME6404 course project
- Iranian Elite Association
- Iranian Society of Mechanical Engineers

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## MENTORING AND LEADERSHIP EXPERIENCE

### **Fulton Undergraduate Research Initiative (FURI) Mentor**, Arizona State University

- Helped students define their research projects and write a proposal.
- Helped students identify the material and equipment needed for their project.
- Worked with the student to budget the project and purchase required items.
- Guided students to conduct the experiments and write reports.

### **The Vertically Integrated Projects (VIP) Program Student Mentor**, Georgia Tech

- Led the undergraduate VIP class in 'augmented robotic musicianship' project
- Helped the mechatronics design group, comprised of mechanical and electrical engineers in designing a robotic arm.
- Coordinated group meetings and set deadlines for accomplishing designated tasks.
- Cooperated with other groups to share design data and make sure the design meets the criteria for sensing and artificial intelligence groups.

### **President of volleyball club student organization**, 2017-2019 Arizona State University

- Organized campaigns for acquiring new members.
- Organized weekly practice sessions and games.
- Organized friendly matches

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## CERTIFICATES

- Certificate of attendance in Quality management Systems Internal Audit Training Course (based on ISO9110:2008), TUV Nord academy, Iran-Germany (<http://www.tuvsudiran.com>).
- Foundations of Programming: Object-Oriented Design, Lynda.com, Issued Oct 2016. Credential ID 953C6B.
- C++ Essential Training, Lynda.com, Issued Sep 2016, Credential ID E77CC3.
- Certificate of attendance in "Process Piping Design" and "Welding Inspection" workshops, Nazeran Yekta Co., Isfahan, Iran ([www.nazeranyekta.com](http://www.nazeranyekta.com)).

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## SOFTWARE AND PROGRAMMING SKILLS

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| • SolidWorks | • Python  | • MATLAB   |
| • Ansys      | • C++     | • SIMULINK |
| • MAX/MSP    | • Arduino | • LabVIEW  |

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## REFERENCES

Available upon request.