

ROOZBEH KHODAMBASHI EMAMI

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

Research Interests

I have been researching in the area of Robotics and Mechatronics for the past few years. Specifically, I am working on developing novel robotic platforms as well as robotics subsystems (sensors, actuators, algorithms) including but not limited to medical robotics, robots used as prosthesis and robots meant to augment humans.

EDUCATION

Arizona State University

Ph.D. in Systems Engineering

Tempe, AZ

07 Jan 2017 - In progress

Georgia Institute of Technology

Masters of Science in Music Technology

Atlanta, GA

20 Aug 2014 - 06 Aug 2016

Amirkabir University of Technology

Masters of Science in Biomedical Engineering - Biomechanics

Tehran, Iran

23 Sep 2005 - 17 Mar 2008

Shahrekord University

Bachelors of Science in Mechanical Engineering

Shahrekord, Iran

22 Sep 2000 - 19 Apr 2005

PATENTS

- Gil Weinberg, **R. Khodambashi**, “**A Wearable Robotic Limb**”, US Patent Pending, Application No. 62/258,571, GaTech invention disclosure reference number GTRC 7108
- **R. Khodambashi**, A. Darabi, “**A High Voltage Piezoelectric Generator**”, US patent Pending, Application No. 62/184,870
- **R. Khodambashi**, S. Najarian, “**Tactile Device for Skin Lesion Detection**”, *The Judiciary of Iran*, Registration Number: 42618, 24th. September, 2007.
- **R. Khodambashi**, M.B. Dehkordi, A.A. Dehkordi, “**Computer System for Studying Vibration Phenomenon for use in Mechanical Vibration Laboratories**”, *The Judiciary of Iran*, Registration Number: 43205, 9th. October, 2007.

PUBLICATIONS

- **Journal Papers**
 1. **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.
 2. 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).
 3. 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.
- **Conference Papers**
 1. **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.
 2. **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.
 3. 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 *Micro Electro Mechanical Systems (MEMS), 2017 IEEE 30th International Conference on* (pp. 362-365). IEEE.
 4. Sharifzadeh, Mohammad, **Roозbeh 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.

5. Sharifzadeh, Mohammad, **Roozbeh Khodambashi**, and Daniel M. Aukes. "**On Locomotion of a Laminated Fish-inspired robot in a Small-to-size Environment**." *ASME 2018 International Design Engineering Technical Conferences and Computers and Information in Engineering Conference*. American Society of Mechanical Engineers, 2018.

MEMBERSHIPS AND AWARDS

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

CERTIFICATES

- Certificate of attendance in Quality management Systems Internal Audit Training Course (based on ISO9110:2008), TUV Nord academy, Iran-Germany (<http://www.tuvnordiran.com>).
- Certificate of attendance in "Process Piping Design" and "Welding Inspection" workshops, Nazeran Yekta Co., Isfahan, Iran (www.nazeranyekta.com).

SOFTWARE AND PROGRAMMING SKILLS

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

RESEARCH, INDUSTRIAL AND COURSE PROJECTS

- **Robotics**
 - Designing a robotic arm attached to human body to serve as an extra arm in performing different tasks (Master's project)
 - Designing an EMG acquisition and processing device for a robotic arm for an amputee drummer (Master's research)
- **Mechatronics and Control**
 - Design and Fabrication of a Computerized System for Studying Mechanical Vibrations (B.Sc. thesis)
 - Design and construction of a medical desktop autoclave system (as part of my job responsibilities)
 - Design and construction of a PID temperature controller with the accuracy of 0.1 degree Celsius
- **Tele-Medicine**
 - Tactile Device for Lesion Detection in Soft Tissue, *M.Sc. thesis* (published paper)
- **Finite Element Modeling**
 - A Structural Model for Simulating the Mechanical Response of Fingertip to Tactile Stimuli (B.Sc. thesis)
 - Designing a Dental Implant (finite element class project)

LEADERSHIP EXPERIENCE

Augmented robotic musicianship project

Atlanta, GA

Undergraduate Student Mentor

January 2015 – May 2016

- 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
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SKILLS

Communication

- Ability to create and execute effective presentations to wide variety of audiences
- Experienced in writing both academic and technical reports
- Bilingual. Fluent in written and spoken English and Persian

Software and programming

- MATLAB: digital signal processing, control, real-time workshop
- SIMULINK: SimMechanics, Robotics System Toolbox, Simulink 3D Animation
- Implementing machine learning and AI algorithms
- C++: Standard libraries, OpenCV
- ROS
- SOLIDWORKS: 3D design, SOLIDWORKS simulation
- COMSOL Multiphysics: Solid Mechanics, Electromechanics, MEMS module
- LabVIEW: Data acquisition, signal processing and control
- MAX/MSP: Audio design and processing, image processing (Jitter)
- Arduino: PID controller, Sensor interfacing

Selected Graduate Coursework

- Robotics
- Advance control systems design
- Digital Design
- Introduction to MEMS
- Artificial Organs and Limbs
- Audio Digital Signal Processing
- Music Perception and Cognition
- Finite Element Methods in Biomechanics
- Biomechanics of Bone and Bone Fracture

EMPLOYMENT

Tuba Negin Co. Ltd.

Medical Equipment Engineer

Tehran, Iran

Oct 2011 – Jul 2014