

Ramin Fathian

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Education

Master of Science, Mechanical Engineering, University of Alberta [May 2018 – Present]
Thesis: *Biomechanical Assessment of Vertical Jumping Using Wearable Technologies*

Bachelor of Science, Mechanical Engineering, Shiraz University [Sep 2013 – Jul 2017]
Thesis: *Hybrid Position Control of 4 Wheel Robot Using Accelerometer and Camera Feedback Compensator*

Publications

Conference Proceeding:

1. A. Khandan, **R. Fathian**, J. Carey, and H. Rouhani, 2021, *Intra-Subject Repeatability of Joint Angle Measurement During Skating on Synthetic Ice*, XXVIII Congress of International Society of Biomechanics (ISB), Stockholm, Sweden (Submitted)
2. K. Xing, **R. Fathian**, C. Ho, and H. Rouhani, 2021, *Sitting Direction Assessment for Interface Pressure Measurement Devices Using Center of Pressure*, Canadian Society for Mechanical Engineering International Congress, Charlottetown, Canada (Submitted)
3. **R. Fathian**, A. Noamani, C. Ho, and H. Rouhani, 2021, *Manual Wheelchair Stroke Time Estimation Using Hand-Mounted Sensor*, Canadian Society for Mechanical Engineering International Congress, Charlottetown, Canada (Submitted)
4. A. Khandan, **R. Fathian**, J. Carey, and H. Rouhani, 2020, *Ice-Skating Temporal Events Detection Using Inertial Sensors Data*, 21st Alberta Biomedical Engineering Conference, Banff, Canada
5. **R. Fathian**, A. Khandan, L.Z.F. Chiu, H. Rouhani, 2020, *Vertical Jump height estimation using reconstructed pelvis method in countermovement jump*, 21st Biennial Meeting of the Canadian Society for Biomechanics, Montreal, Canada
6. **R. Fathian**, A. Khandan, L.Z.F. Chiu, H. Rouhani, 2020, *Jump height estimation using a single wearable inertial sensor mounted on sacrum*, Canadian Society for Mechanical Engineering International Congress, Charlottetown, Canada
7. **R. Fathian**, L.Z.F. Chiu, H. Rouhani, 2019, *Countermovement jump phase detection using a single tri-axial accelerometer placed on the foot*, 20th Alberta Biomedical Engineering Conference, Banff, Canada
8. **R. Fathian**, A. Aghamaleki Sarvestani, M. Eghtesad, A. Moeini, 2017, *Optimization of the on-off angle range of the pneumatic actuators of Shiraz University lower extremity exoskeleton*, in Farsi, 25th International Conference on Mechanical Engineering (ISME), Tehran, Iran
9. A. Moeini, **R. Fathian**, M. Eghtesad, A. Aghamaleki Sarvestani, 2017, *4-Wheel robot positioning using image processing techniques and comparison of experimental data with the desirable Path*, in Farsi, 25th International Conference on Mechanical Engineering (ISME), Tehran, Iran

Honours and Awards

1. Smart Network Innovation Fund, University of Alberta
2. Graduate Students Teaching Award, Faculty of Graduate Studies and Research, University of Alberta
3. Faculty of Engineering Early Career Researcher Award, University of Alberta
4. University of Alberta Graduate Students' Association Academic Travel Award
5. Awarded to be a member of the Golden Key International Honor Society as a top 15 percent graduate student of the University of Alberta
6. Best Scientific Competition Award at 6th National Iranian Academic Competition (Motion Festival)

Research Experience

Research Assistant, Neuromuscular control and biomechanics laboratory, [May 2018 – Present]

- **Biomechanical Assessment of Vertical Jumping using wearable sensors**
 - Conducted research to assess vertical jumping using wearable sensors
 - Developed signal-processing based algorithms to assess physical performance using IMU
 - Validated the algorithm using EMG, Motion Capture System, and Force-plate
 - Designed an experimental setup for assessing vertical jumping.
- **Activity monitoring using wearable sensors for individuals with ACL Injuries**
 - Developed algorithms to monitor the physical activity based on an ankle-mounted sensor
 - Developed a GUI and stand-alone software for technology transfer
- **Simulating environmental impacts on building envelopes using machine learning**
 Led the team to extract features and train the machine learning algorithm using the historical big data provided by an industry partner to predict design parameters

Intern, CAP Corp. AB, Canada, [Aug 2019 – Sept 2019]

- **Instrumentation design to assess neck injury and concussion**
 Designed two biomedical instruments to assess the risk of neck injury and concussion based on the impact test and characterizing the impact using inertial sensors and load cells

Research Assistant, Shiraz University, Iran

[Sep 2014 – May 2017]

- **Path Planning for 4-wheel Omni-wheel Robot,**
 - Conducted path planning for a robot using image processing and signal processing
 - Prototyped a 4-wheel Omni-wheel robot equipped with 4 DC motors and, a servo motor, a camera, Arduino controller, and an accelerometer
- **Optimizing Switch Controllers of Lower Extremity Exoskeleton,**
 Optimized the controller thresholds of a pneumatically powered lower-extremity exoskeleton designed for rehabilitation purposes.
- **Assistive Camera Holder Robotic Arm for Laparoscopy Surgery,**
 Collaborated with the mechanical engineering group to design and prototype an assistive robotic arm for laparoscopy surgery to hold and move the camera based on the surgeon's commands
- **Lumbar Puncture Pressure Logger,**
 Designed a pressure logger for lumbar puncture for precise measurement of cerebrospinal fluid opening pressure and reducing the lumbar puncture side effects

Teaching Experience

Teaching Assistant, Mechanical Engineering Department, University of Alberta

- Mechanical Measurement Laboratory (6 semesters) [Sep 2018 – Present]

Teaching Assistant, Mechanical Engineering Faculty, Shiraz University

- Numerical Methods for Engineers [Jan 2016 – May 2016]
- Engineering Drawing I [Sept 2015 – Dec 2015]

Computer and Technical Skills

Programming, Scripting, and Simulation:

- MATLAB and Simulink (Digital Signal Processing, Curve Fitting, Optimization)
- Python (PyCharm, Jupyter, Visual Studio Code, NumPy, SciPy, Panda, Bokeh)
- Object-Oriented Programming

Technical

- Optoelectronic Motion Tracking Systems: VICON
- Wearable Motion Tracking Systems: XSENS, GaitUp

- Electromyography (EMG) Measurement: Delsys
- External Force Measurement Systems: AMTI Force Plate

Leadership, Volunteering, and Services Experience

University of Alberta, Edmonton, AB, Canada

- Member** of Graduate Student Safety Committee (GSSC), Depart. Mechanical Engineering [Jan 2020 – Present]
- Representative** of Graduate Students' Association (GSA) at FGSR council [Aug 2019 – Present]
- Member of GSA at Election and Referenda Committee** [Aug 2019 – Present]
- Representative** of NCB Lab at Festival of Health [May 2019]
- Judge**, Festival of Undergraduate Research and Creative Activities [Mar 2019]
- Volunteer**, Office of Safe Disclosure, University of Alberta [Jan 2019 – Present]
- Representative** of NCB Lab at University of Alberta Open House [Oct 2018]
- Registration Officer**, the Faculty of Engineering Graduate Research Symposium (FEGRS) [Jul 2018]
- Poster Session Administrator**, FEGRS [Jul 2018]

Shiraz University, Shiraz, Iran

- Vice-President** of Mechanical Engineering Students' Scientific Association (MESSA), Shiraz University [Sep 2014 – Sep 2016]
 - Organized events, workshop, seminars, and field trips
 - Communicated with industry partners and sponsors to hold workshops and support undergraduate research projects
 - Mentored students in research and connected them to university innovation centers
- Co-Founder and Director** of "Yalda Night" event, Shiraz University [Feb 2014 – Feb 2016]
An annual charity event to support patients with cancer consisted of booths and fundraising.
 - Performed strategic planning of short-term and long-term vision of the event
 - Organized fundraising events at the Shiraz University campus and the Shiraz Cultural Centres
- Deputy Director** of "Shetab" student journal, Shiraz University [Sep 2015 – Sep 2016]
- Organizer** of 3d Glider Competition, Shiraz University [Mar 2016 – Apr 2015]

Language Competencies

- Superior skills in English (IELTS score 7.5, 2017)
- Basic skills in French
- Native Farsi speaker

General Trainings

- Ethics and Professionalism Training
- Supervisory EHS (Environment, Health & Safety) Professional Development
- Workplace Hazardous Materials Information System (WHMIS)
- Laboratory Safety
- Construction Safety Training

References

References will be provided upon request.