**Seyed Yahya Shirazi**

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## EDUCATION

*Doctor of Philosophy*, Mechanical Engineering — Jan. 2017 - Apr. 2021
University of Central Florida (UCF), Orlando, FL — (expected)
THESIS - Corticomuscular adaptation to mechanical perturbations in a seated locomotor task
GPA 3.75

*Master of Science*, Biomedical Engineering - Biomechanics — Sep. 2011 - Feb. 2014
Tehran Polytechnic, Tehran, Iran
THESIS - Dynamic postural stability analysis on standing normal subjects and transtibial amputees
GPA 3.76

*Bachelor of Science*, Biomedical Engineering - Biomechanics — Sep. 2007 - Sep. 2011
Tehran Polytechnic, Tehran, Iran
GPA 3.70, Top 3, Honor Student

## RESEARCH AND TEACHING EXPERIENCE

*University of Central Florida (UCF)*, Orlando , FL — Jan. 2017 – Present
BRaIN Laboratory — Graduate Research Assistant

**Research focus:** Human neural and biomechanical responses to perturbation during locomotion. We use a plethora of biomedical sensors (EEG, EMG, motion capture, and force sensors) to reach to an integrative perspective about the human responses at cortical, muscular, and biomechanical levels. This project is supported by the National Institute on Aging of the National Institutes of Health (NIH).

**Secondary Focus:** Improving the sensor design and the processing pipelines to overcome motion artifacts in biological signals. The new sensor design involves dual-layer EEG, where the second layer only records artifacts from the environment. The processing improvements include a subject-specific pipeline for detection and rejection of the artifacts.

*University of Central Florida (UCF)*, Orlando , FL — Jan. 2017 – Aug. 2017
Mechanical and Aerospace Enginerring Department — Graduate Teaching Assistant

I was a graduate teaching assistant for undergraduate solid mechanics (Spring 2017) and undergradute dynamics (Summer 2017). Both instructors gave me the highest possible evaluation, and one even wrote that I was their top TA during their 30 years of teaching experience.

*Tehran Polytechnic*, Tehran, Iran — Sept. 2011 – Feb. 2014
Department of Biomedical Engineering — Graduate Research Assistant

We compared responses of transtibial amputees and healthy participants to different mechanical perturbations during standing. I designed and created a multi-directional moving platform to perturb subjects standing on top of the platform.

*Tehran Polytechnic*, Tehran, Iran — Sept. 2013 – May 2013
Department of Biomedical Engineering — Graduate Teaching Assistant

I was teaching assitant for the Biomechaincs undergtraduate course delivered by Professor Mohamad Parnianpour.

*Shahid Beheshti University of Medical Sciences (SBMU)*, Tehran, Iran — March 2011 – Aug. 2011
Functional Neurosurgery and Stereotaxy Research Centre — Biomechanics Research Intern

- Six months of first-hand neurosurgery OR experience
- Human spine 3D modeling from CAT scans using Mimics, Geomagic XOR, and SolidWorks
- FEA analysis of the spinal cord disorders using Ansys

*Tehran Polytechnic*, Tehran, Iran — Sept. 2009 – May 2010
Department of Biomedical Engineering — Undergraduate Teaching Assistant

I was the youngest teacher assistant in the deprtment for the undergraduate programming course for two semsters.

## PROFESSIONAL EXPERIENCE

*KASA Co.*, Tehran, Iran — May 2014 – Dec. 2016
R&D Manager

KarAfarinan Sarafraz Asia (KASA) is a startup company active in supplying automotive parts for passenger vehicles. During my tenure as an associate engineer and then R&D manager, I was responsible for technical negotiations with the OEMs, designing and developing new test instruments, and creating a brand-new engine management system. The engine management system development was a multidisciplinary effort with ~$650k budget and landed significant supply contracts for the startup.

## PUBLICATIONS (journals and proceedings)

**Shirazi, S.Y.** and Huang, H. J. *Differential theta-band signatures of the anterior cingulate and motor cortices during seated locomotor perturbations*, IEEE Transactions on Neural Systems and Rehabilitation Engineering, 2020 (under review)

**Shirazi, S.Y.** and Huang H.J., *More Reliable EEG Electrode Digitizing Methods Can Reduce Source Estimation Uncertainty, But Current Methods Already Accurately Identify Brodmann Areas*, Frontiers in Neuroscience, Nov 2019. (DOI: 10.3389/fnins.2019.01159)

**Shirazi, S.Y.** and Huang H.J., *Influence of Fiducial Mislocation on EEG Source Estimation*, Full Contribution Paper, IEEE/EMBS Conference on Neural Engineering (NER), San Francisco, CA, July 2019. (DOI: 10.1109/NER.2019.8717065)

Sarafpour M., **Shirazi S.Y.**, Shirazi E., Ghazaei F., and Parnianpour Z., *Postural Balance Performance of Children with ADHD, with and without Medication: A Quantitative Approach*, Full Contribution Paper, 40$^{\text{th}}$ Intl. Conference of the IEEE Engineering in Medicine and Biology Society (EMBC'18), Honolulu, HI, July 2018. (DOI: 10.1109/EMBC.2018.8512636)

Radaei F., **Shirazi S.Y.**, Gharibzadeh S., Khashayar P, Ramezani M, and Fatouraee N: *Evaluation of Relationship Between Balance Parameters and Bone Mineral Density*, 22$^{\text{nd}}$ Iranian Conference on Biomedical Engineering (ICBME 2015), IOST, November 2015. (DOI: 10.1109/ICBME.2015.7404167)

**Shirazi S.Y.**, Safaee Z., and Fatouraee N.: *The Need for Stump-Socket Interface Pressure Measurement during Bidirectionally Perturbed Stance in Transtibial Amputees*, 21$^{\text{st}}$ Iranian Conference on Biomedical Engineering (ICBME 2014), AUT, November 2014 (DOI: 10.1109/ICBME.2014.7043925)

## PATENT

Shirazi S.Y., *Centrifugal micro-viscometer: A lab-on-a-chip device to assess the viscosity of biological fluids*, Iran Patent #77944, June 2012

## CONFERENCES (peer reviewed, selected)

**Shirazi, S.Y.** and Huang H.J., *Use-dependent learning, not error-based learning, occurs during perturbed recumbent stepping*, 44$^{th}$ Annual Meeting of the American Society of Biomechanics (ASB), Atlanta, Georgia, August 2020

**Shirazi, S.Y.** and Huang H.J., *Electrocortical and motor responses to perturbations are not necessarily coupled*, 4$^{th}$ International Conference on Mobile Brain/Body Imaging (MoBI), La Jolla, CA, June 2020 (accepted, postponed to June 2021 due to the pandemic)

Shaffer T., **Shirazi S.Y.**, and Huang H.J., *Older adults demonstrate sustained adaptation to frequent perturbations in recumbent stepping*, 49$^{th}$ Society for Neuroscience Annual Meeting, Chicago, IL, October 2019 (ref: 763.18.2019)

**Shirazi S.Y.** and Huang H.J., *Step Initiation Perturbations Lead to Sustained Adaptation*, 40$^{th}$ Intl. Conference of the IEEE Engineering in Medicine and Biology Society (EMBC'18), Honolulu, HI, July 2018

Huang H.J. and **Shirazi S.Y.**, *Adapting to Perturbations during Rhythmic Arm and Leg Movements*, 47$^{th}$ Society for Neuroscience Annual Meeting, Washington, DC, November 2017 (ref: 2017-S-16447-SfN)

**Shirazi S.Y.**, Safaee, Z. and Fatouraee N.: Residuum-Prosthesis Interface Pressure Changes in Standing Transtibial Amputees during Bidirectional Surface Perturbations, 11th Iranian Congress of Orthotics and Prosthetics, IUMS, November 2014

Sarafpour M. and **Shirazi S.Y.**, and Shirazi E.: Postural Stability Analysis of Attention Deficit/Hyperactive Adolescents, 1st National Conference on Individual-Social Empowerment of People with Special Needs, IAUQ, October 2014

## INVITED TALKS

**Shirazi, S.Y.**, *Motor learning from the neuromechanical perspective*, guest lecture for the Motor Learning and Development Course, EDPH 304, University of South Carolina Upstate, Spartanburg, SC, October 2020

**Shirazi, S.Y.** and Huang H.J., *Neuro-Rehabilitation*, Acada Talks, University of Central Florida, February 2018

**Shirazi S.Y.** Rahimi A., Fatouraee N., and Seddighi A.S., *Stress Analysis in an Inter-Body Graft under Dynamic Loading via Finite Element Method*, Invited talk to the Seminar on Biomechanics of Spinal Column, SBMU, March 2011

## OUTREACH and SERVICE

### Serivce

Version Control and GitHub workshop group leader, Annual Meeting of the American Society of Biomechanics (ASB), August 2020

### Graduate mentorship

Co-advised a Masters student in Biomedical Engineering for the pre and post-operation postural stability of paitients with lower back pain, Advisor: Dr. Nasser Fatouraee, 2016

Co-advised a Masters student in Clinical Psychology for the postural stability analysis on ADHD children, Advisor: Dr. Elham Shirazi, MD, 2015

### Undergraduate mentorship

Co-mentored a UCF female freshman to present at the Society of Neuroscience Meeting, Chicago, IL, 2019

Co-mentored a UCF female sophomore to prototype a magnetic break for assistive devices, BRaIN Lab, 2018

Co-advised a Tehran Polytehcnic senior for her bachelor project on the corrleation between osteoporosis and postural stability, 2015

**Outreach**

PedsAcademy STEM Day for the in-patient children, Nemours Children's Hospital, May 2019

UCF STEM Day, demonstrated Biomechanics of the Muscles movement to middle-school students Oct 2018

UCF STEM Day, an advocate for "Staying active and smartphoning it!!" to K-12 students Oct 2017

Camp Connect II, lab members led a session called "Neuromechanics" to high school students June 2017

## EXTRACURRICULAR TRAINING

- ISO 9001:2008 quality system management auditor, IMQ Academy
- ISO 13485:2003 and Legal requirements for medical device manufacturers and distributors, Iran's FDA
- MATLAB Academy courses on programming techniques, data visualization, machine learning, and deep learning

## AWARDS

- Frank Hubbard Endowed Scholarship, UCF, 2020
- Honor graduate student at Tehran Polytechnic, 2011
- Top 0.5% National University Entrance Exams, 2007