Seyed Yahya Shirazi

Ph.D. Candidate
University of Central Florida
email: shirazi@ieee.org
cell: +1 (407) 801-0090
https://neuromechanist.github.io

EDUCATION

Doctor of Philosophy, Mechanical Engineering — Jan. 2017 - Apr. 2021 (expected)
University of Central Florida (UCF), Orlando, FL
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 and Teaching 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 achieve robust biological signals. Our research on 3D scanning of EEG electrodes shed light on the empirical necessity of knowing precise sensor locations. We currently study and develop sensors that concurrently record from body and environment. The processing improvements include high-performance and subject-specific pipelines for detection and rejection of artifacts.

Teaching: Solid Mechanics (Spring 2017); Dynamics (Summer 2017)

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

Research focus: Postural balance biomechanics. 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.

Teaching: Biomechaincs (Fall 2013, Spring 2013)

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

Research focus: Biomechanics of the nervous system.

- Six months of first-hand neurosurgery OR experience
- One-year experience of neurosurgery patient visit shadowing
- 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
The youngest teacher assistant in the department for the Programming course (Fall 2009, Spring 2009)

PUBLICATIONS (journals and proceedings)

Shirazi, S.Y. and Huang, H. J. (in preparation) *Group-level functional corticomucular connectivity during seated locomotor perturbations for young and older adults*, Neuroimage, 2021

Shirazi, S.Y. and Huang, H. J. (in preparation) *Young adults use task specific strategies while older adults use non-specific muscle co-contraction strategies during perturbed stepping*, Scientific Reports, 2021

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, 2021. (DOI: 10.1109/tnsre.2021.3057054)

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/ebmc.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$^{\text{th}}$ 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$^{\text{th}}$ 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$^{\text{th}}$ 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*, 40th 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*, 47th 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

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