Ehsan T. Esfahani

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EDUCATION

Doctor of Philosophy in Mechanical Engineering (2012)
University of California, Riverside, CA
Dissertation Title: *Investigation of Brain Computer Interface as a New Modality in CAD Systems.*

Master of Science in Electrical Engineering (2012)
University of California, Riverside, CA
Thesis Title: *Multi-sensor Wireless System for Fault Detection in Induction Motors.*

Master of Science in Mechanical Engineering (2007)
University of Toledo, Toledo, OH
Thesis Title: *Developing an Active Ankle Foot Orthosis Based on Shape Memory Alloys.*

Bachelor of Science in Mechanical Engineering–Manufacturing (2004)
Isfahan University of Technology, Isfahan, Iran
Thesis Title: *Developing a Fully Autonomous Humanoid Robot.*

PROFESSIONAL EXPERIENCES

University at Buffalo, State University of New York, Buffalo NY (Aug. 2018 – Now)
Associate Professor, Department of Mechanical and Aerospace Engineering.

University at Buffalo, State University of New York, Buffalo NY (Aug. 2012 – Aug 2018)
Assistant Professor, Department of Mechanical and Aerospace Engineering.

Roswell Park Cancer Institute, Buffalo NY (March 2013 – Feb. 2016)
Adjunct Assistant Professor, Department of Oncology and Robotic Surgery.

University of California, Riverside CA (Sep. 2008 – July 2012)
Research Assistant, Department of Mechanical Engineering.

General Motors R&D (Jan. 2008 – Sep. 2008)
Project Engineer, Electrical and Control Integration Lab.

University of Toledo, Toledo OH (Jan. 2006 – Dec. 2007)
Research Assistant, Dynamic and Smart Systems Lab.

Isfahan Science and Technology Town, Isfahan Iran (Sep. 2004 – Jan. 2006)
Robotic Engineer, DRobotics Center.

ACHIEVEMENTS and AWARDS

- American Power Public Associations DEED Scholarship, Jan 2012.
- Dissertation Year Fellowship Award, UC Riverside, 2011-2012.
- Lung-Wen Tsai Memorial Scholarship in Mechanical Design, UC Riverside, April 2010.
- Graduate Dean Fellowship, UC Riverside, Sep 2008- Sep 2010.
- National Science Foundation (NSF) Travel Fellowship (Cell Mechanics Workshop), July 2007.
- 2nd Place Award in Humanoid Soccer Robots Technical Challenge at International RoboCup Competition, LisbonPortugal, July 2004.

Updated on 4/11/2019

GRANT SUPPORT

- **NSF, Smart and Connected Health (Awarded-Active).**
  Title: Collaborative: Cognitive Haptic Based Rehabilitation System for Patient-Centric Home.
  Total Award: $708,058 (UB Share: $271,093).
  Duration: 09/15-08/19. **Role**: PI(UB Share 100%).

- **Empire State Development, Buffalo Fund Accelerator (Awarded-Active).**
  Title: Adjustable stiffness robotic gripper for safe human-robot collaboration. **Total Award**: $55,271.
  Duration: 09/19-08/20. **Role**: PI (Share 100%).

- **NSF, Innovation Corps (Awarded-Active).**
  Title: Robotic Gripper with Adjustable Stiffness. **Total Award**: $3,000.
  Duration: 01/19-04/19. **Role**: PI(Share 100%).

- **UB SMART Center of Excellence (Awarded-Active).**
  Title: Noise Regulation in Drones for Co-Robotic Environments: Investigating Impact on Human Hearing and Cognition. **Total Award**: $25,000.
  Duration: 06/19-06/20. **Role**: Co-PI (Share 30%), PI: Souma Chowdhury, CoPI: Mostafa Nouh.

- **NVIDIA Corporation (Awarded)**
  Title: Deep Learning for Adaptive Human-Robot Interaction using Brain Computer Interfaces.
  Total Award: GPU (Titan Xp) Hardware Donation. **Role**: PI (Share 100%).

- **Roswell Park Alliance (Awarded-Completed).**
  Title: Cognitive Skill Assessment during Robotic-Assisted Surgery. **Total Award**: $14,700.
  Duration: 05/14-12/14. **Role**: PI (Share 100%).

- **Institute for Person-Centered Care (Awarded-Completed).**
  Title: Comprehensive In-home Monitoring for Post Stroke Mobility. **Total Award**: $6,998.
  Duration: 06/15-05/16. **Role**: PI (Share 100%).

- **NSF Center for eDesign (Awarded-Completed).**
  Title: Human-Centered Adaptation for Accelerated Work Force Training. **Total Award**: $30,000.
  Duration: 02/16-01/17. **Role**: Co-PI(Share 50%), PI: Karthik Dantu.

- **NSF: National Robotics Initiative 2.0 (Pending).**
  Title: Cognitive Adaptation for Physical Human-Robot Interaction. **Total Award**: $620,083.
  Duration: 09/19-08/22. **Role**: PI (Share 70%).

- **NSF: EAGER on Artificial Intelligence (AI) and Society (Pending).**
  Title: AI-DCL:Cognitive-Behavior Model to Predict Human Reaction to Swarm AI Non-Compliance.
  Total Award: $298,734. **Duration**: 09/19-08/21. **Role**: PI (Share 50%), CoPI: Souma Chowdhury.

- **NASA: STTR-Subcontract(Pending).**
  Title: Closed-loop Risk-adaptive Interface for Swarm-Human Partnership.
  Total Award: $61,250. **Duration**: 08/19-09/20. **Role**: Co-PI (Share 33%), PI: Souma Chowdhury, CoPI: Karthik Dantu.

- **NSF: Cyber Physical System (Pending).**
  Title: Flexible Autonomy in Networked Human-Swarm Teams.
  Total Award: $1,022,942. **Duration**: 09/19-08/22. **Role**: CoPI (Share 33%), PI: Souma Chowdhury, CoPI: Karthik Dantu, CoPI: Yekaterina Bezrukova.

PUBLICATIONS (Bold names correspond to student co-author, * indicates articles after joining UB)

Book Chapters: 4 (2 after joining UB), **Journal Articles:** 16 (11 after joining UB), **Conference Papers:** 43 (35 after joining UB), **Patents:** 2 (1 after joining UB), **Under review:** (6 Journal articles, 0 Conference Proceedings). **Google Scholar Metric**–Citations: 511, h-index: 11.

Book Chapters

*B4 **Manjunata, H.**, and Esfahani, ET., "Application of Reinforcement and Deep Learning Techniques in Brain Machine Interfaces." *Advances in Motor Neuroprostheses*, Ed. by R.Vinjamuri, Springer (Invited Contribution).

*B3 Esfahani, ET., McBride, DW., **Shafiei, SB.** and Obenaus, A., "A Real-Time Analysis of Traumatic Brain Injury from T2 Weighted Magnetic Resonance Images Using a Symmetry-based Algorithm." *Video Bioinformatics*, Vol. 22, Ed. by Bhanu, B., Talbot., P., Pp. 99-117, Springer 2015, doi: 10.1007/978-3-319-23724-4_5. Link

B2 Elahinia, MH., Esfahani, ET. and Wang, S., "Control of SMA systems: Review of the State of the Art." *Shape Memory Alloys: Manufacture, Properties and Applications.* Ed. by Chen, RC., Pp. 49–68, Nova Science Publishers, Inc. 2010, ISBN: 978–1–60741–789–7.

B1 Esfahani, ET., "Dynamic Modeling with Dymola." *A Key to Fundamental Software Packages in Mechanical Engineering.* Ed. Forouzan, M., Pp. 259–274, Kelid-Amouzesh Press, Iran 2005, ISBN: 964–8617–45–7.

Journals

*J16 **Jujjavarapu, S.**, **Memar, AH.**, Karami, MA and Esfahani, ET., "Variable Stiffness Mechanism for Suppressing Unintended Forces in Physical Human Robot Interaction." *Journal of Mechanism and Robotics*, Vol. 11, No. 2, Pp. 020915, 2019, doi: 10.1115/1.4042295, (IF: 2.233). Link

*J15 **Baghdadi, A.**, Megahed, F., Esfahani, ET. and Cavuoto, L., "A Machine Learning Approach to Detect Changes in Gait Parameters Following a Fatiguing Occupational Task." *Ergonomics*, Vol. 61, No. 8, Pp. 1116-1129, 2018, doi: 10.1080/00140139.2018.1442936, (IF: 2.019).Link

*J14 **Memar, AH.**, and Esfahani, ET., "Physiological Measures for Human Performance Analysis in Human-Robot Tele-Exploration." *IEEE Access*, Vol. 6, Pp. 3694-3705, 2018, doi: 10.1109/ACCESS.2018.2790838, (IF: 3.557).Link

*J13 **Ghobadi, M.**, Singla, P. and Esfahani, ET., "Robust Attitude Estimation from Uncertain Observations of Inertial Sensors using Covariance-Inflated Multiplicative Extended Kalman Filter." *IEEE Transactions on Instrumentation and Measurement.* Vol. 67, No. 1, Pp. 209-217, 2018, doi: 10.1109/TIM.2017.2761230, (IF: 2.704). Link

*J12 **Ghobadi, M.**, and Esfahani, ET., "A Robust Automatic Gait Monitoring Approach using a Single IMU for Home-based Applications." *Journal of Mechanics in Medicine and Biology.* Vol. 17, No. 5, Pp. 17500771-20, 2017, doi: 10.1142/S0219519417500774, (IF: 0.875). Link

*J11 **Ghobadi, M.**, Majji, M. and Esfahani, ET., "AOSID: An Analytical Solution to the Output-Only System Identification Problem to Estimate Physical Parameters and Unknown Input Simultaneously." *Structural Control and Health Monitoring.* Vol. 24, No. 8, e1951, 2017, doi: 10.1002/stc.1951, (IF: 3.622). Link

*J10 *Hussein, AA., ***Shafiei, SB.**, Sharif, M., Esfahani, ET., Ahmad, B., Kozlowski, JD., Hashmi, Z. and Guru, KA. "Technical Mentorship during RobotAssisted Surgery: a Cognitive Analysis." *British Journal of Urology.* Vol. 118, No. 3, Pp. 429-36, 2016, doi: 10.1111/bju.13445, (IF: 4.688). Link – ***First co-authorship.**

*J09 Guru, KA., **Shafiei, SB.**, Khan, A., Hussein, A., Sharif, M. and Esfahani, ET., "Understanding Cognitive Performance during Robot Assisted Surgery." *Urology*, Vol. 86, No. 4, Pp. 751–757, 2015, doi: 10.1016/j.urology.2015.07.028, (IF: 2.300). Link – **Featured as the cover article.**

*J08 Guru, KA., Esfahani, ET., Raza, SJ., Wang, K., Wilding, G., **Bhat, R.**, and Chowriappa, AJ., "Cognitive Skills Assessment During Robot-Assisted Surgery: Separating Wheat From Chaff." *British Journal of Urology.* Vol. 115, No. 1, Pp. 166–174, 2015, doi: 10.1111/bju.12657, (IF: 4.688). Link – **This paper was featured in Nature Review.**

*J07 Esfahani, ET. and Horwath, I. "Application of Brain Computer Interfaces in CAD/E Systems", *Computer-Aided Design.* Vol. 54, Pp. 1–2, 2014, doi: 10.1016/j.cad.2014.05.011, (IF: 2.947). Link

*J06 Esfahani, ET., Wang, S. and Sundararajan, V., "Multi-Sensor Wireless System for Eccentricity and Bearing Fault Detection in Induction Motors." *IEEE/ASME Transaction on Mechatronics.* Vol. 19, No. 3, Pp. 818–826, 2014, doi: 10.1109/TMECH.2013.2260865, (IF: 3.936). Link

J05 Esfahani, ET. and Sundararajan V., "Classification of Primitive Shapes Using Brain-Computer Interfaces." *Computer-Aided Design.* Vol. 44, No. 10, Pp. 1011–1019, 2012, doi: 10.1016/j.cad.2011.04.008, (IF: 2.947). Link

J04 Esfahani, ET. and Sundararajan V., "Using Brain-Computer Interfaces to Detect Human Satisfaction in Human-Robot Interaction." *International Journal of Humanoid Robotics.* Vol. 8, No. 1, Pp. 87-101, 2011, doi: 10.1142/S0219843611002356, (IF: 0.908). Link

J03 Esfahani, ET. and Elahinia, MH., "Developing an Adaptive Controller for a Shape Memory Alloy Walking Assistive Device." *Journal of Vibration and Control.* Vol. 16, No. 13, Pp. 1897-1914, 2010, doi: 10.1177/1077546309344163, (IF:2.197). Link

J02 Esfahani, ET. and Elahinia, MH., "Stable Walking Pattern for an SMA-Actuated Biped." *IEEE/ASME Transaction on Mechatronics.* Vol. 12, No. 5, Pp. 534-541, 2007, doi: 10.1109/TMECH.2007.905707, (IF: 3.936). Link

J01 Azimi, E., Ghobadi, M., Esfahani, ET., Keshmiri, M. and Tehrani AF., "Three-Dimensional Smooth Trajectory Planning Using Realistic Simulation." *Lecture Notes in Computer Science.* Vol. 3276, Ed. by D. Nardi et. al, Pp. 381-392, Springer-Verlag GmbH, 2005, doi: 10.1007/978-3-540-32256-6_31, (IF: 0.402). Link

Journals–Submitted (Under Review)

*S06 **Baghdadi, A.**, Cavuoto, LA., Jones-Farmer, A., Rigdon, SE., Esfahani, ET., and Megahed, FM., "Estimating the Onset of Physical Fatigue at the Workplace: A Statistical Perspective on Using Wearables to Detect Changes in Gait Trajectory Parameters." *Journal of Quality Technology*, Submitted, 2018.

*S05 **Manjunatha, H.**, Pareek, S., **Memar, AH.**, Kesavadas, T., and Esfahani, ET., "Effect of Haptic Assistance Strategy on Mental Engagement in Fine Motor Tasks." *Medical & Biological Engineering & Computing*, Submitted, 2018.

*S04 Younespour, M., Atighehchian, A, Kianfar, K., and Esfahani, ET., "Using Mixed Integer Programming and Constraint Programming for Operating Rooms Scheduling with Modified Block Strategy." *Operations Research For Health Care*, Submitted, 2018.

*S03 **Memar, AH.** and Esfahani, ET., "Objective Assessment of Human Workload in Physical Human-Robot Cooperation using Brain Monitoring." *ACM Transactions on Human-Robot Interaction*, Submitted, 2018.

*S02 **Memar, AH.** and Esfahani, ET., "EEG Activity Analysis for Within- and Cross-Task Workload Estimation in Teleoperation." *IEEE Transactions on Cognitive and Developmental Systems*, Submitted, 2018.

*S01 **Memar, AH.** and Esfahani, ET., "Variable Stiffness Gripper Using Permanent Magnets", *IEEE Transaction on Industrial Electronics*, Submitted, 2019.

Patents

*P02 **Memar, AH.** and Esfahani, ET., "Variable Stiffness Robotic Manipulator using Permanent Magnet", (Patent No. PCT/US2018/035919).

P01 Azimi, E., Ghobadi, M., Esfahani, ET., Goudarzi, O. and Keshmiri, M., Dynamic Control of Humanoid Robot with minimum control parameters Patent No.32266-Date 7/23/2005 Iran.

Peer-Reviewed Conference Proceedings

*C43 **Jujjavarapu, S**, and Esfahani, ET., "'A Variable Stiffness Mechanism for Stable Interaction in Collaborative Environment: An EMG Study." *2019 ASME IDETC Conference*, Aug. 18-21, 2019– Anaheim, CA.

*C42 **Jujjavarapu, S.**, and Esfahani, ET., "A Variable Stiffness Mechanism for improving stability in upper limb rehabilitation." *41st Annual International Conference of the IEEE Engineering in Medicine & Biology Society (EMBC)*, July 23-27, 2019–Berlin, Germany.

*C41 **Gorantla, KR.**, and Esfahani, ET., "Classification of Motor Control Features for Surgical Skill Assessment during Robot-Assisted Surgery." *41st Annual International Conference of the IEEE Engineering in Medicine Biology Society (EMBC)*, July 23-27, 2019–Berlin, Germany.

*C40 Pareek, S., **Manjunatha, H.**, Esfahani, ET., and Kesavadas, T., "MyoTrack: Tracking Subject Participation in Robotic Rehabilitation using sEMG and IMU." *International Symposium on Medical Robotics*, April 3-5, 2019– Atlanta, GA.

*C39 **Manjunatha, H.**, **Memar, AH.**, and Esfahani, ET., "Classification of Task Type and Reaction Time of Operator in Simulated Multiple Robot Tele-Exploration." *2nd International Neuroergonomics Conference*, June 27-29, 2018– Philadelphia, PA.

*C38 **Memar, AH.**, and Esfahani, ET., "Using EEG for Predicting User Preferences of Physical Compliance in Human-Robot Cooperation ." *2nd International Neuroergonomics Conference*, June 27-29, 2018– Philadelphia, PA.

*C37 **Jujjavarapu, S.**, Karami, MA and Esfahani, ET., "Variable Stiffness Mechanism for Tremor Suppression in Human-Robot Interaction." *2018 ASME IDETC/CIE Conference*, Aug 26-29, 2018–Quebec City, Canada.

*C36 **Memar, AH.**, and Esfahani, ET., "A Variable Stiffness Gripper with Antagonistic Magnetic Springs for Enhancing Manipulation." *Robotics: Science and Systems*, June 26-30, 2018– Pittsburgh, PA.

*C35 **Memar, AH.** and Esfahani, ET., "EEG Correlates of Motor Control Difficulty in Physical Human-Robot Interaction: A Frequency Domain Analysis." *IEEE Haptics Symposium*, Pp.229-234, March 25-28, 2018–San Francisco, CA.

*C34 **Jujjavarapu, S**, **Memar, AH.** and Esfahani, ET., "Design of a 2D haptic system with passive variable stiffness using permanent magnets for upper-limb rehabilitation." *2017 ASME IDETC Conference*, Aug. 30-Sep. 2, 2017–Cleveland, OH.

*C33 **Memar, AH.**, Mastroarde, N. and Esfahani, ET., "Design of a Novel Variable Stiffness Gripper Using Permanent Magnets." *IEEE International Conference on Robotics and Automation*, May 29-June 3, 2017–Singapore.

*C32 **Memar, AH.** and Esfahani, ET., "Design of a Novel Variable Stiffness Gripper." *IEEE International Symposium on Robot and Human Interactive Communication*, Aug. 26-31, 2016–New York City, NY.

*C31 **Memar, AH.** and Esfahani, ET., "Human Control of Multiple Robots in a Collaborative Tele-Exploration." *IEEE International Symposium on Robot and Human Interactive Communication*, Aug. 26-31, 2016–New York City, NY.

*C30 **Ghobadi, M.** and Esfahani, ET., "A Robust Method to Improve Estimation Accuracy of Walking Gait Kinematics by Considering Geometrical Constraints on Kinect Data." *ASME IDETC 2016 Conference*, Aug. 21-24, 2016–Charlotte, NC.

*C29 Pillai, N., Patra, A. and Esfahani, ET., "Modeling Post-Impact Injury Propagation in Traumatic Brain Injury.", *ASME IDETC 2016 Conference*, Aug. 21-24, 2016–Charlotte, NC.

*C28 **Dinparastdjadid, A.** and Esfahani, ET., "Spike Sorting via Multi-Cluster Feature Selection." *ASME IDETC 2016 Conference*, Aug. 21-24, 2016–Charlotte, NC.

*C27 **Memar, AH.** and Esfahani, ET., "Human Performance in a Mixed Human-Robot Team: Design of a Collaborative Framework." *ASME IDETC 2016 Conference*, Aug. 21-24, 2016–Charlotte, NC.

*C26 **Ghobadi, M.**, Yuqian, Z., Rana, A., Esfahani, ET. and Esfandiari, L. "Quantitative Estimation of Electro-osmosis Force on Charged Particles inside a Borosilicate Nanopore-Based Sensor." *38th International Conference of IEEE Engineering in Medicine and Biology*, IEEE EMBC 2016, Aug. 16-20, 2016–Orlando, FL.

*C25 Guru, KA., **Shafiei, SB.**, Khan, A., Sharif, M., Raza, S.J., Fiorica, T., Wing, J., Durrani and Esfahani, ET., "Surgical Workload Evaluation during Robotic Assisted Surgery." *American Urological Association Annual Meeting*, May 15-19, 2015–New Orleans, LA.

*C24 Guru, KA., **Shafiei, SB.**, Khan, A., Sharif, M., Korszen, S., Berka, C. and Esfahani, ET., "Surgical Mentorship During Robot-assisted Surgery: Is the Surgeon really with the Program?" *Science of Team Science Conference*, June 2-5, 2015–Bethesda, MD.

*C23 **Ghobadi, M.**, Kesavadas, T., Sosnoff, J. and Esfahani, ET., "Using Minimum Jerk Model for Human Activity Classification in Home-Based Monitoring." *IEEE International Conference on Rehabilitation Robotics*, Aug. 11-14, 2015–Singapore.

*C22 **Shafiei, SB.**, Guru, KA. and Esfahani, ET., "Using Two-Third Power Law for Segmentation of Hand Movement in Robotic Assisted Surgery." *ASME IDETC 2015 Conference*, Aug. 2-5, 2015–Boston, MA.

*C21 **Ghobadi, M.**, Majji, M. and Esfahani, ET., "Simultaneous Output-Only Identification of Physical Parameters and Unknown Inputs of Linear Systems." *ASME IDETC 2015 Conference*, Aug. 2-5, 2015–Boston, MA.

*C20 **Pareek, S., Sharma, V.** and Esfahani, ET., "Human Factor Study in Gesture Based CAD Environment." *ASME IDETC 2015 Conference*, Aug. 2-5, 2015–Boston, MA.

*C19 Esfahani, ET., **Pareek, S.**, Chembrammel, P., **Ghobadi, M.** and Kesavadas, T., "Adaptation of Rehabilitation Systems based on Users Mental Engagement." *ASME IDETC 2015 Conference*, Aug. 2-5, 2015–Boston, MA.

*C18 **Memar, AH.** and Esfahani, ET., "Modeling and Dynamic Parameter Identification of the Schunk Powerball Robotic Arm." *ASME IDETC 2015 Conference*, Aug. 2-5, 2015–Boston, MA.

*C17 Bani-Hani, M., Borazjani, I., Esfahani, ET., Krovi, V. and Karami, AM., "Generation and Optimization of Traveling Vibrating Waves in Self-Assembling Swimming Smart Boxes", *ASME IDETC 2015 Conference*, Aug. 2-5, 2015–Boston, MA.

*C16 Daghooghi, M., Borazjani, I., Karami, MA. and Esfahani, ET., "Self-Assembling Swimming Smart Boxes." *ASME 2014 Smart Materials, Adaptive Structure and Intelligent Systems*, Sep. 8-10, 2014–Newport, RI.

*C15 Karami, MA., Esfahani, ET., Daghooghi, M. and Borazjani, I.,"Self-propelled Swimming Simulations of Self-Assembling Smart Boxes." *ASME 2014 Smart Materials, Adaptive Structure and Intelligent Systems*, Sep. 8-10, 2014–Newport, RI.

*C14 **Ghobadi, M.** and Esfahani, ET., "Foot-Mounted Inertial Measurement Unit for Activity Classification." *36th International Conference of IEEE Engineering in Medicine and Biology*, IEEE EMBC 2014, Aug. 26-30, 2014–Chicago, IL.

*C13 **Ghobadi, M.** and Esfahani, ET., "Adaptive Segmentation of Air Gesture Identification." *ASME IDETC 2014 Conference*, Aug. 17-20, 2014–Buffalo, NY.

*C12 **Shafiei, SB.** and Esfahani, ET., "Synchronization of Brain Activity and Sketch Features in a Multi-Modal CAD Interface." *ASME IDETC 2014 Conference*, Aug. 17-20, 2014–Buffalo, NY.

*C11 Deshpande, A., Esfahani, ET. and Rai, R., "Geon and Non-Accidental Relations in 2D Shape Abstraction: a BCI Study." *ASME IDETC 2014 Conference*, Aug. 17-20, 2014–Buffalo, NY.

*C10 Shankar, SS., Prakhar, J., Esfahani, ET. and Rai, R., "Sketching in Air: a Single Stroke Classification Framework." *ASME IDETC 2014 Conference*, Aug. 17-20, 2014–Buffalo, NY.

*C09 **Bhat, R.**, Deshpande, A., Rai, R. and Esfahani, ET., "BCI Touch- Based System, a Multimodal CAD Interface for Object Manipulation." *ASME 2013 International Mechanical Engineering Congress & Exposition*, Nov 15-21, 2013–San Diego, CA.

C08 Wang, S., Esfahani, ET. and Sundararajan, V., "Evaluation of SSVEP as Passive Feedback for Improving the Performance of Brain Machine Interfaces." *ASME IDETC Conference*, Aug. 12-15, 2012–Chicago, IL.

C07 Esfahani, ET. and Sundararajan, V., "Using Brain Computer Interfaces For Geometry Selection In CAD Systems: P300 Detection Approach." *ASME 2011 IDETC Conference*, Aug. 28-31, 2011–Washington, DC.

C06 Esfahani, ET. and Sundararajan, V., "A Text Understanding Interface for Physical System Modeling and Simulation." *ASME 2009 IDETC Conference*, Aug. 30-Sep. 2, 2009–San Diego CA.

C05 Esfahani, ET., Elahinia, MH., Hefzy, MS. and Armstrong, C., "Shape Memory Alloys, An Alternative Actuation Method for Orthosis." *North American Congress on Biomechanics*, Aug. 5-9, 2008–Ann Arbor, MI.

C04 Esfahani, ET., Elahinia, MH. and Hefzy, MS., "Developing an Active Ankle Foot Orthosis Based on Shape Memory Alloy Actuators." *ASME 2007 Summer Bioengineering Conference*, June 20-24, 2007 –Keystone, CO.

C03 Tarkesh, E. and Elahinia, MH., "Nonlinear Control Techniques for a SMA Active Ankle Foot Orthosis." *ASME 2007 International Mechanical Engineering Congress & Exposition*, Nov 11-15, 2007–Seattle, WA.

C02 Esfahani, ET. and Elahinia, MH., "Walking Pattern Filter for Dynamic Biped Robot with SMA actuators." *ASME 2006 International Mechanical Engineering Congress & Exposition*, Nov. 5-10, 2006–Chicago, IL.

C01 Ghobadi, M., Azimi, E., Esfahani, ET. and Keshmiri, M., "Stable Walking Pattern Generation for Humanoid Robot." *In Proc. of 13th International Conference on Mechanical Engineering (ISME 2005)*, Pp.2303, 17-19 May 2005–Isfahan, Iran.

Conference/Workshop Abstracts & Posters

*A10 Pareek, S., Chembrammel, P., Esfahani, ET., Kesavadas, T., "Cognitive haptic based rehabilitation system for patient-centric home therapy.", *39th Annual International Conference of the IEEE Engineering in Medicine and Biology Society*, July 11-15, 2017–Jeju Island, Korea.

*A09 Auerbach, BD., Chen, GD., Ding, D., **Ghobadi, M.** Esfahani, ET. and Salvi, RJ. "Maladaptive neuronal gain enhancement along the ascending auditory pathway following acoustic trauma." *Neural Circuits*, April 6-9, 2016–Cold Spring Harbor, NY.

*A08 **Ghobadi, M.**, **Memar, AH.** and Esfahani, ET., "Employing Human Gestural Feedback in Physical Human-Robot Interactions Based on IMU and EMG Sensors." *IEEE International Conference on Robotics and Automation*, May 26-30, 2015–Seattle, WA.

*A07 **Pareek, S.**, Kesavadas, T. and Esfahani, ET., "Using Brain Monitoring for Adaptive Human Robotic Interaction in Robotic Rehabilitation." *Personal Health and Human Performance Conference* Dec. 9, 2014–Dayton, OH.

*A06 **Shafie, SB.**, Guru, KA, Sharif, M. and Esfahani, ET., "Using Human Motor Control for Classification of Surgical Expertise." *Clinical Translation of Medical Robots Workshop in IEEE/RSJ International Conference on Robotics and Systems*, Sep. 17, 2014–Chicago, IL.

A05 Esfahani, E.T., Zimcosky, M., and Elahinia, M., "Design and Control a SMA Walking Robot." *Proceedings of SPIE Smart Structures and Materials*, March 8-12, 2009–San Diego, CA.

A04 Esfahani, ET. and Elahinia, MH., "The Nonlinear Stress Based Switching Control for Shape Memory Alloy Actuators." *12th Conference on Nonlinear Vibration, Dynamics and Multibody Systems*, June 15, 2008–Blacksburg, VA.

A03 Esfahani, ET., Elahinia, MH. and Hefzy, MS., "Sliding Mode Controller for a Knee Prosthesis Actuated by Shape Memory Alloy." *11th Conference on Nonlinear Vibration, Stability and Dynamics of Structures*, Aug 1317, 2006–Blacksburg, VA.

A02 Esfahani, ET., Tehrani, AF. and Tarkesh, H., "Pre-controlling the Semi-Passive Biped Walking Gait Using Realistic Simulation and Genetic Algorithm." *15th International Symposium on Measurement and Control in Robotic*, 810 Nov. 2005–Brussels, Belgium.

A01 Esfahani, ET. et all. "Persia Robot Team Description Paper." *In Proc. of 6th International Robocup Symposium*, Pp. 495, 2425 June 2002–Fukuoaka, Japan.

Invited Talks

*T08 Enhancing the Human-Robot Interaction via Brain Computer Interfaces, *Cognitive Science Colloquium, University at Buffalo Psychology Department, Buffalo, NY*, April 2018.

*T07 Enhancing the Human-Robot Interaction via Brain Computer Interfaces, *Department of Electrical Engineering and Computer Science, University of Cincinnati, Cincinnati, OH*, Aug. 2017.

*T06 Human Activity Classification using single Inertial Measurement Unit, *Amiigo, Mountain View, CA*, May. 2014.

T05 New Generation of CAD/E Systems based on Brain Computer Interaction, *Advanced Brain Monitoring, Carlsbad, CA*, June 2012.

T04 Hybrid Brain Computer Interface-SSVEP and Motor Imagery, *Department of Mechanical Engineering, University of California, Riverside CA*, June 2012.

T03 New Generation of CAD/E Systems based on Brain Computer Interaction, *Department of Mechanical Engineering, University at Buffalo SUNY, Buffalo NY*, May 2012.

T02 Using Brain Computer Interfaces in CAD systems, *Neurosky Inc.*, San Jose CA, May 2012.

T01 Nonlinear Control Techniques for Precise Actuation of Shape Memory Alloys, *General Motors Fuel Cell Research Center, Honeoye Falls, NY*, Sep. 2007.

SERVICES

Professional Community Services

Advisory Board:
Department of Mechanical Engineering, University of California Riverside (Sep 2015 – Now).

Guest Editor:
Journal of Computer-Aided Design, Special issue on Application of Brain Computer Interfaces in Next Generation of Computer-Aided Design/Engineering Systems (Published Sep. 2014).

Conference Chair:
ASME 9th Frontiers in Biomedical Devices Conference, ASME IDETC 2016, Charlotte, NC.
ASME 10th Frontiers in Biomedical Devices Conference, ASME IDETC 2017, Cleveland OH.

Associate Editor:
IEEE International Conference on Robotics and Automation (ICRA 2014).

Local Organizing Chair:
ASME 2014 International Design Engineering Technical Conferences and Computers & Information in Engineering Conference (IDETC/CIE 2014), Buffalo NY.

Program Committee Member:
IEEE International Conference on Information and Automation (ICIA 2015), Lijiang, Yunnan, China.

Conference Session Chair:
Wearable and Implantable Technologies in 10th Frontiers in Biomedical Devices Conference, IDETC 2017, Cleveland, OH. *Digital Human Modeling* in 9th Frontiers in Biomedical Devices Conference, IDETC 2016, Charlotte, NC. *Simulation Based Design under Certainty Session* in 41th Design Automation Conference, IDETC 2015, Boston NY. *Motion Planing Session* in 39th Mechanisms and Robotic Conference, IDETC 2015, Boston MA. *Orthopedic and Rehabilitation Session* in 8th Frontiers in Biomedical Devices, IDETC 2015, Boston MA. *Multimodal Interface for Engineering Design Session* in 34th Computer and Information in Engineering Conference, IDETC 2014, Buffalo, NY. *Simulation Based Design under Certainty* in 40th Design Automation Conference, IDETC 2014, Buffalo NY.

Reviewer Coordinator:
Simulation Based Design under Uncertainty, 40th Design Automation Conference IDETC 2014, Buffalo NY. Simulation Based Design under Uncertainty, 41th Design Automation Conference DAC, IDETC 2015, Boston MA.

Journal/Conference Manuscript Review

Journal: Science Robotics, IEEE Transaction on Robotics, IEEE Robotics & Automation Magazine, IEEE Transactions on Biomedical Engineering, IEEE/ASME Transactions on Mechatronics, IEEE Transactions on Industrial Electronics, PLOS ONE, Computer-Aided Design, Robotics and Autonomous Systems, Robotica, Intelligent Manufacturing, Measurement, Journal of Intelligent Material Systems and Structures, Nano-Communications, Annuals of Biomedical Engineering, Sensors, International Journal of Advanced Robotic Systems, Computer Methods and Programs in Biomedicine, Journal of Intelligent & Robotic Systems, Automation in Construction, Actuators, ASME Journal of Mechanism and Robotics.

Conference: ASME International Design Engineering Technical Conferences (IDETC 2011, IDETC 2013, IDETC 2014, IDETC 2015, IDETC 2016, IDETC 2017, ICRA 2018), IEEE International Carpathian Control Conference-(ICCC 2012), IEEE International Conference on Robotic and Automation (ICRA 2014, ICRA 2015, ICRA 2017), IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2014), ACM/IEEE International Conference on Human Robot Interaction (HRI 2015), International Conference on Robotics and Biomimetics (ROBIO 2014), IEEE Haptic Symposium 2018.

Panel Review (National Science Foundation)

- Panelist for Computer and Information Science and Engineering (CISE). Spring 2019
- Panelist for Future of Work at the Human-Technology Frontier Program (FW-HTF). Spring 2019

University Services

- Served on IMPACT Physical and Engineering Review Panel, February 2016.
- Human-in-loop Systems Workshop, Computational and Data-Enabled Science and Engineering Day, March 2016.

Departmental Services

- Member of MAE Strategic Planning Committee, Fall 2018 –Current.
- Member of MAE Graduate Studies Committee, Fall 2013 –Fall 2018.
- Member of MAE Faculty Search Committee, Spring 2013, 2014, 2015 and 2016.
- Judge for MAE Student Poster Competition, Spring 2013, Spring 2014 and 2016.
- Department Coordinator for UB/McNari Graduate School Visit, Summer 2014.

RESEARCH SUPERVISION

PhD Students–Current

Hemnath Manjunatha, PhD. Student, Fall 2016 – Current
Dissertation Title: *Enhancing Human-Robot Interactions using Deep learning.*
– Received 2017 CIE Student Travel Award in IDETC 2017.

Sri Sadhan Jujjavarapu, PhD. Student, Summer 2017 – Current
Dissertation Title: *Dynamic Manipulation using Adjustable Stiffness Gripper.*

PhD Students–Previous

Mostafa Ghobadi, 2013–2017
Dissertation Title: *Physiological Signal Analysis for Home-based Activity Monitoring.*
– Received VIB Student Travel Award in IDETC 2015.
– **Current Position**: Director of Robotics, Calvary Robotics, Rochester, NY.

Amirhossein H. Memar, 2014–2018
Dissertation Title: *Shared Control for Object Grasping and Manipulation in Tele-Robotics.*
– Received 2015 CIE Student Travel Award in IDETC 2015.
– **Current Position**: Postdoctoral Research Scientist at Facebook Reality Labs, Redmond, WA.

Amir Baghdadi, 2014-2018
Dissertation Title: *Physical Fatigue Detection using Inertial Measurement Sensors.*
Co-advised with Lora Cavuoto from Industrial and System Engineering.
– **Current Position**: Postdoctoral Research Scientist at University of Calgary, Calgary, AB, Canada.

Master Students–Current

Abhikul Kumar Singh Sep. 2018 – Now.
Thesis Title: *Effect of swarm deviation in human trust.*

Apurvakumar Sharadkumar Jani Sep. 2018 – Now.
Thesis Title: *Cognitive analysis for situation awareness prediction in human-swarm interaction.*

Master Students–Past

Kuber Reddy Gorantla Sep. 2016 – Aug 2018.
Thesis Title: *Motor Control Analysis for Evaluation of Surgeon's Expertise in Robot-Assisted Surgery.*
Current Position: Computer Vision Scientist, ChemImage, Pittsburgh, PA.

Ajaipal Singh Chhina Sep. 2016 – Aug 2018.
Project Title: *Augmented Reality for 3D CAD Object Creation.*
Current Position: Project Engineer, Aerotek, San Francisco, CA.

Peeyush Rajendra Firodiya Jan. 2017 – Aug 2018.
Project Title: *Simulation of Automated Pick and Place in Convenient Stores.*
Current Position: Tooling Engineer, General Motors, Tonawanda, NY.

Jingzhi Wang Sep 2015 – Aug 2017.
Thesis Title: *A Semiautomatic Cell Boundary and Adherens Junction Layers Detection Approach Using Level Set Method.*
Current Position: PhD Student, University of Pittsburgh, Pittsburgh, PA.

Sivakiran Ayyagari Jan. 2016 – Aug. 2017.
Thesis Title: *Human Motor Control Analysis for Cognitive Feedback Estimation in Human–Robot Interactions*
Current Position: Software Developer at ANSYS Inc., Pittsburgh, PA.

Sri Sadhan Jujjavarapu Jan. 2016 – Sep. 2017
Thesis Title: *Design of a 2D Haptic System with Passive Variable Stiffness using Permanent Magnets for Upper-Limb Rehabilitation.*
Current Position: PhD Student, University at Buffalo SUNY, Buffalo, NY.

Amit Nenminisseri Mana April 2016 – Feb 2017
Thesis Title: *Multimodal Human Interface using Sketch, Speech and Brain data in Computer Aided Design.*
Current Position: System Engineer, LexisNexis, Dayton, OH.

Fei Chen Sep 2016 – Feb 2017
Thesis Title: *Augmented Reality for Workforce Training.*
Current Position: NPI Mechanical Product Engineer, Pure Storage, Mountain View, CA.

Yuxiang Chen, M.S., June 2016 – Feb 2017
Project Title: *Ground Reaction Force Estimation in Gait cycle using Wearable Sensors.*
Current Position: Software Engineer, LinkedIn., San Francisco CA.

Yang Yu Jan 2015 – Sep 2016
Thesis Title: *Sketch Based Tutorial System for Drawing Free Body Diagram.*

Hongfei Lin, M.S., Sep 2014 – Dec 2015
Project Title: *Design of a Variable Stiffness Gripper.*
Current Position: Mechanical System Engineer, Buffalo Automation Group, Buffalo, NY.

Zhiqing Zhao, M.S., Sep 2014 – Dec 2015
Thesis Title: *3D Mesh Segmentation with SVM and Boundary Correction.*
Current Position: SQL & Business Intelligence Developer, Anthem Healthcare Inc., Hanover, MD.

Azadeh DinparastDjadid, M.S., Jan 2014– Dec 2015.
Thesis Title: *Spike Sorting via Multi Cluster Feature Selection.*
Current Position: PhD student, University of Wisconsin-Madison.

Shrey Pareek, M.S., Fall 2013–Aug 2015
Thesis Title: *Adaptation of Rehabilitation System Based on User's Mental Engagement.*
Current Position: PhD Student University of Illinois Urbana-Champaign.

Po Sheng Wang, M.S., Spring 2014 –August 2015
Thesis Title: *Kernel Based Support Vector Machine for Human Emotion Detection.*
Current Position: Software developer at Antra Inc.,

Vaibhav Sharma, M.S., Fall 2013–Dec 2014
Project Title: *An Intelligent and Intuitive Approach to 3D Printing Parameter Selection and Design for non-Expert users*
Current Position: Manufacturing Engineer, Formlabs, Boston, MA

Chen Qian, M.S., Fall 2013–Dec 2014
Project Title: *Controlling Google Glass via Brain Activity.*
Current Position: Sales Manager at General Electric, Shanghai, China.

Rohit Bhat, M.S., Fall 2013–June 2014
Thesis Title: *Using Brain Activity for Ambiguity Reduction of Touch-Based Gestures in 3D CAD Environment.*
Current Position: Application and Design Engineer, Power Standards Lab, San Francisco, CA.

Undergraduate Students–Current

Joseph Distefano Sep. 2018 – Now.
Project Title: *Brain controlled prosthesis device.*
– Received Undergraduate Research and Creative Activities Grant.

Undergraduate Students–Past

Joaquin Longares Diez, B.S. Jan. 2017–June 2017
Current Position: MS. Student, Universitat Politecnica de Valencia.

Margaret Lawn, B.S. Sep. 2013–June 2015
– Received 2014 Research and Creativity Scholarship from UB Honor College.
Current Position: PhD. Student, University of Florida.

Brian Le Folch, B.S. Sep. 2013–June 2015
– Received 2014 Research and Creativity Scholarship from UB Honor College.
– Received 2015 SUNY Chancellors Award for Student Excellence.
Current Position: PhD. Student, Massachusetts Institute of Technology.

Yi Jui Lee, B.S. Sep. 2015–June 2016
– Received 2015 UB Undergraduate Awards for Excellence in Research, Scholarship and Creativity.
Current Position: MS. Student, University of British Columbia.

Chameseddine Mballo, B.S Sep. 2013–Dec. 2015
– Received 2014 Zimmer Award.
– Received 2014 Research and Creativity Scholarship from UB Honor College.
– Received 2015 SUNY Chancellors Award for Student Excellence.
Current Position: PhD. Student, Georgia Institute of Technology.

James Rogers, B.S May 2013–May 2014
Current Position: Mechanical Engineer, LVD Strippit, Akron, NY.

Frank Repetti, B.S May 2013–May 2014
– Received Undergraduate Research and Creative Activities Grant.
Current Position: Design Engineer, Cobham plc, Mission System, Orchard Park, NY.

Member of MS Thesis/Project Committees:

PhD Dissertation: Jinmiao Huang (Aug. 2015), Dipanjan Dipak Ghosh (Feb. 2016), Muath Banihani (Sep. 2016), Mojdeh Pajoutan (Dec. 2016), Mohammad Mehdi Maneshi (July 2017), Prakhar Jaiswal (Sep. 2018), Binbin Zhang (Sep. 2018), Hooman Ansari (Sep. 2018).

MS Thesis: Dipen Harish Dave (Jan. 2013), Jinmiao Huang (May 2013), Pramod Chembrammel (June 2013), Sudhanshu Rathod (July 2013), Aditya Reddy Ashammagari (Aug. 2013), Ravikiran Chollangi (Aug. 2014), Aditya Thakur (Aug. 2014), Sree Shankar(Aug. 2014), Karthik Yerrapragada (July 2015), Yao Li (Aug. 2015), Nikhil Sasidharan Pillai (May 2016), Sanchit Kumar Gupta (July 2017), Steve Paul (July 2017).

MS Projects: Akshay Deshpande (Aug. 2014), Azhar Vellor (Dec. 2014), Nianteng Feng (Dec. 2014), Habib Mohd Younus (Dec. 2014), Junqing Deng (Aug. 2015), Kiran Babu Koyalamudi (Dec. 2015), Benjamin Kuch (Dec. 2015), Hamlet Spencer (May 2017).

COURSE TAUGHT

University at Buffalo, SUNY

The course evaluation of the last three offering are shown. The value in the parenthesis shows the overall instructor evaluation. *indicate the average score for the cross listed courses.

MAE 502 Human-Robot Interaction –Spring 19 (Not yet evaluated).

EAS 595 Introduction to Probability for CDSE–Fall 18 (4.9/5).

MAE 509 Probability and Stochastic Process –Fall 18 (4.7/5).

MAE 464/564 Manufacturing Automation – Fall 18 (4.6*/5), Fall 17 (4.54*/5), Fall 16 (4.69*/5).

MAE 527 Intelligent CAD Interfaces – Spring 18 (4.9/5), Spring 16 (4.82/5), Spring 14 (4.5/5).

MAE 477/577 CAD Applications – Spring 17 (4.75*/5), Spring 16 (4.37*/5), Spring 15(4.68*/5).

MAE 376 Mathematical Methods for MAE – Fall 17 (4.4/5), Fall 16 (4.68/5), Fall 15 (4.1/5).

University of California Riverside

ME 001 Introduction to Mechanical Engineering Fall 2011.

Special Lecture on Vibration and System Dynamics Spring 2011

Special Lecture Series on MATLAB Programming Spring 2010

PROFESSIONAL AFFILIATIONS

Member, American Society for Mechanical Engineers (ASME).

Member, Institute of Electrical and Electronics Engineers (IEEE).

Member, Association for Computing Machinery (ACM).

Member, Association for Advancement of Artificial Intelligence (AAAI).