Ali Marjaninejad

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Education

University of Southern California
Ph.D. Biomedical Eng. GPA: 3.95/4.0,
Expected: Summer 2021
M.Sc. Electrical Eng.
GPA: 3.88/4.0, Track: Data Science
Amirkabir University of Tech.
M.Sc. Biomedical Eng.
GPA: 4.0/4.0, Track: Signal Proc.
Sahand University of Tech.
B.Sc. Electrical Eng.
GPA: 3.8/4.0, Minor: Biomedical

Skills

- Programming: Proficient in Python, MATLAB, intermediate in C and R
- Machine Learning: Proficient in feature extraction, Supervised, Unsupervised, and Reinforcement Learning and Optimization: SVM, Neural Networks, Decision Making, Clustering, Classification, Regression methods, Policy and Value based methods, Genetic Algorithm, etc.
- Hardware design: Experienced in bio amplifiers, analogue filters, PCB design, and microcontrollers

Software and toolboxes:

TensorFlow, Keras, Scikit-learn, Open AI gym and baselines, Numpy, Pandas, SciPy, Matplotlib, and Bokeh libraries, MuJoCo-py, pybullet

DSP, DIP, Deep Learning, Optimization, and Statistics toolboxes + Simulink

MuJoCo physics simulator, PSpice, Eagle Cad, Adobe Illustrator, Adobe Photoshop, Microsoft Office

Related Coursework

- Estimation theory
- Statistical signal processing
- Advanced digital signal processing
- Biological signal processing
- Pattern recognition
- Computational intelligence
- Foundations of Artificial Intelligence
- Cognition and brain physiology
- Advanced studies of the nervous system
- Neural implant engineering
- Medical imaging systems
- Medical image processing
- Neuromechanics

Highlights:

- 14 peer-reviewed publications (+80 citations) including a research paper being featured on the cover of "Nature Machine Intelligence" and a book chapter in "Springer Nature" Tracts in Advanced Robotics and IEEE conferences such as IROS and EMBC
- 7 years of research experience in Robotics, Biological Signal Processing, Machine Learning, and Algorithms: Time and Frequency domain analysis, Multi-dimensional signal processing, hardware design, Pattern recognition, Supervised, Unsupervised, and Reinforcement learning

Honors and Awards

- Appeared on more than 80 news outlets including the Wired magazine, PCMag, and VoA for research contributions
- USC Provost's fellowship; the most prestigious fellowship at USC (Duration: 2015 – 2019)
- USC Grad. school's Research enhancement fellowship recipient; The most competitive PhD research award at USC (2018 – 2019)
- USC Stevens center for innovation's "Best Commercial Potential" award for the work done on bio-inspired autonomous robots (2019)
- Society for Brain Mapping & Therapeutics (SBMT) and Brain Mapping Foundation Student Outstanding Leadership and Service Award (2019)
- USC Grad. Student Government's International Student Recognition Award (2018)
- Featured on USC news for volunteering in instructing MATLAB classes for students in the SHINE program (2016)
- Awarded the Certificate of Appreciation from the Deputy Minister of Science for my active role in the "Bioelectric" journal (awarded as the best national student journal of 2009 - Iran)

Professional Experiences

- Internship as a Data Scientist at NovaSignal (formerly: Neural Analytics; Summer 2018)
  - Worked on algorithms to improve the search speed and efficiency of the robotic brain scanner
  - Designed machine learning protocols to enable robotic system to make data-driven clinical decisions
- Internship at the MRI section of the exclusive service provider for the GE Healthcare company in Iran (Tajhizat Pezeshki Pishrafteh, 2011)
  - Contributed to both hardware and software Installation, repair, and maintenance
  - Mastered the general principles of physics of imaging modalities especially the MRI; Mastered image processing in MATLAB
- A.I. Residency offer from Google X (2019)
- Research Assistant at Brain-Body Dynamics Lab: Exploring the neuromechanics of the hand and its representation in human cortex (2016 – present)
  - Finding sensory motor representations on human brain in EEG, ECoG, and Single Unit Activity (SUA) signals
  - Showed that a linear mapping can efficiently describe the relationship between finger positions (joint angles) and signal power in different frequency bands of ECoG recordings
  - Used Genetic Algorithm (GA) to find optimal tendon excursion values in a tendon-driven robotic limb (with unknown parameters) to follow a desired trajectory
  - Addressed the long-standing problem of redundancy in the anthropomorphic neuromechanics using optimization and dimensional reduction approaches
  - Developed the Neuromechanics toolbox in MATLAB environment as a complementary toolbox for the book: Fundamentals of Neuromechanics
  - Led two groups of interns in hardware and software development projects; resulted in peer-reviewed publications and raising research grant funding
- Attended Computational sensory-motor neuroscience (CoSMo) and Health data exploration (HDE) summer schools (2017, 2018)
  - Received competitive merit-based fellowships to attend each program
  - Trained to work with bigdata, neural data, and health related data by the most famous leaders of the field
- Research assistant at intelligent signal and data processing lab: Biological and Array signal processing (2012-2015)
  - Used SVM and Neural Network regressors to predict the direction of arrival of a sound wave to a microphone array system
  - Collected a database of microphone array recordings using Persian vocabulary and implemented a MATLAB toolbox that increased speech recognition ratio using beamforming; the project was later integrated successfully in industry
- Instructed three subjects (Microprocessors lab, Circuits design lab and Electronics design lab) at Amirkabir University of Technology and holding two MATLAB workshops per year at USC

Certificates

- Health, Technology, and Engineering (HTE) certificate, USC
- Data Scientist with Python accomplishment certificate, DataCamp, August 2020
- ISO 13485 Internal audit training certificate, Oxfordcert. Registration Number: TIA1331509010

Professional contributions, Services, and Memberships

- Assistant editor of Paladyn, Journal of Behavioral Robotics – De Gruyter
- Chairing the "Brain-machine Interface and Sensory Perception" session at ICONIP 2020
- Co-chairing the "Biorobotics and Biomechanics & Computational Systems & Synthetic Biology; Multiscale modeling" session at IEEE EMBC 2018
- President of the student branch of the Society for Brain Mapping & Therapeutics (SBMT) at USC
- Vice president of the Iranian Graduate Student Association (IGSA) at USC
- IEEE Student member; Society for Neuroscience (SfN) student member; American Society of Biomechanics (ASB) student member
- References are available upon request