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| **Dr. Maryam Ahmadi, PhD**  **COGNITIVE NEUROSCIENCE | SIGNAL PROCESSING | MACHINE LEARNING**  maryamahmadi529@gmail.com  **951 231 3891** | |  |
| **OVERVIEW**  **Cognitive Neuroscience, Signal Processing and Machine Learning professional** with eight plus years of experience. Team builder with excellent communications, time & resource management.  **EDUCATION**   * **PhD,** University of Leicester, UK, PhD in Bioengineering, Center for Systems Neuroscience * **MS,** American University of Sharjah, UAE, Master of Science in Mechatronics, College of Engineering * **BS,** Azad University, Naein, IRAN, Bachelor of Science in Electronics, Department of Engineering   **CAREER ACHIEVEMENTS**   * Extensive experience in designing, recording and analyzing neural and behavioral correlates of cognitive processing including **face perception, perceptual learning, attention, memory formation, retrieval and consolidation, and cognitive control**. * Experience in signal processing techniques, such as wavelet denoising, to **extract meaningful biological information** embedded under biological and environmental noise. * Equipped with experience in utilizing statistical techniques which include Correlation, Hypotheses modeling, Inferential Statistics as well as data mining and modeling techniques using **supervised** and **unsupervised machine learning techniques.** * More than **4 years experience in teaching** Electrical Engineering and computer science topics at university level courses. * Experience in **supervising** bachelor and master projects. * More than 10 years experience in using different **Matlab** toolbox to pre-process and analysis bio-signals. * Equipped with experience in presenting scientific topics for both scientific community and general audience. * Proficient in research of current process and emerging technologies which need analytic models, data inputs and output, **analytic metrics** and user interface needs and the ability to effectively communicate complex concepts * Highly motivated self-starter with the ability to work efficiently with minimal supervision and direction. * Demonstrated experience steering cross-functional projects and teams and influencing decision makers. * Proven organizational and interpersonal skills with the ability to adapt to a rapidly changing environment. | **Core Competencies**  **Signal Processing**   * Wavelet denoising * Time-frequency analysis using Wavelet and Hilbert transform * Correlation * Time series analysis * Filter design * Phase-amplitude coupling   **Machine Learning**   * Linear regression & Non-linear regression * K-nearest neighbor classification, Logistic regression, Decision trees & Support vector machine * K-means Clustering * Neural Networks   **Neuroscience Analytics**   * EEG Recording: BioSemi ActiveTwo (64 electrodes) and Brain Products (BrainAmp 32 and 64 electrodes) * EEG/ERP Analysis using: Matlab, Brain Vision Analyzer, EEGlab and BrainStorm * BESA Research/MRI/Statistics (familiar) * EDA and HRV Recording * Sleep Scoring using GAMA Review   **Programming and Tools**   * Matlab  1. Signal Processing Toolbox 2. Wavelet toolbox 3. Curve fitting toolbox 4. Statistics and Machine learning toolbox  * Python * Pandas, numpy and scikit-learn * TensorFlow * SPSS * Azure Machine Learning * Tableau | |

**CERTIFICATIONS**

**Machine Learning with Python**

Coursera, issued April 2020

Credential: https://www.youracclaim.com/badges/80d94d48-2f5a-469b-80f9-f7acf5f50a49

**Neural Network and Deep Learning**

Coursera, issued April 2020

Credential: https://www.coursera.org/account/accomplishments/verify/REXUNCHS7XXG

**WORK EXPERIENCE**

**Postdoctoral researcher / Associate Specialist**

**University of California, Irvine Nov2017-Dec2017**

**University of California, Riverside Jan 2015 – Oct 2017**

* Studied neural correlates underlying human perceptual learning in both early and higher level visual cortex.
* Investigated semantic memory formation, retrieval and sleep consolidation.
* Designed and developed EEG/ERP experiments to study working memory in healthy young adults and older adults.
* Subject matter expert in setting up an EEG/ERP lab to study brain electrical responses during sleep (EEG) and brain cognitive processes in wakefulness (ERP).
* Designed, acquired, cleaned and analyzed EEG and ERP data using **Matlab.** Performed data extraction, manipulation, cleaning, analysis, modeling and data mining.
* Designed, modeled, validated and tested statistical algorithms against various data sets including behavioral data and deployed **predictive models** using **python.**
* Performed Data Transformation method for Rescaling and Normalizing variables.
* Built models using regression to predict brain electrical responses as well as behavioral responses.
* Conducted data evaluations and present findings in several conferences.

**Visiting Fellow Mar 2014 – Jan 2016**

**Center for Systems Neuroscience, University of Leicester, Leicester**

* **Modeled Visual Evoked Potentials** (VEPs) based on the Additive and Phase-Resetting Hypothesis.
* Studied applications of denoising single trial evoked potentials in clinical settings.
* Analyzed ERP responses using Matlab & shared for peer review.
* Used classification methods to classify ERP responses and deployed **predictive models** using Matlab**.**

**PhD Sep 2009 – Jan 2014**

**Center for Systems Neuroscience, University of Leicester, Leicester**

* Recorded human brain electrical responses to sensory and cognitive processes.
* Developed the first fully automatic algorithm to extract ERP data from background, **Matlab** **GUI** available at: <https://www2.le.ac.uk/centres/csn/software/ep_den>
* Recorded, Extracted and analyzed ERP response to conscious **face perception**.
* Modeled ERP responses and investigated the theories related to ERP generations.
* Used classification methods to classify ERP responses and deployed **predictive models** using Matlab**.**

**SABBATICAL**

**Parental Leave, since Jan 2018**

**In Parallel active research and further education via self-study**

* Studied applications of denoising single trial evoked potentials in clinical settings.
* Took online courses in python, machine learning, deep learning and data science topics.
* Studying semantic memory formation and retrieval and memory consolidation during sleep.
* Modeling VEPs and Developing methods to study neural generations of ERPs.

**ML PROJECTS**

**Modeling consolidation of declarative memory during sleep, University of California Irvine, 2020**

In this project, human behavioral responses in a semantic memory association task and brain electrical responses during wakefulness (ERPs) and electroencephalogram (EEG) activities during sleep were recorded. Two major oscillatory activities, slow oscillation and spindles, were shown to interact during sleep and had correlations with memory retrieval and the behavioral responses during wakefulness. The goal of the project was to model sleep EEG activities using ERP and behavioral responses during wakefulness. Feature selection was performed using the Wrapper method to reduce the dimensions of the data and find the best predictive features. Several linear regression algorithms (**Linear regression**, **Support Vector Machine**, **Ridge and Lasso** **Regression**) were tested using **Python** and the highest R squared (0.72) and the lowest mean squared error (1.8) values were obtained with the Support Vector Machine.

**Classifying ERPs generated with Additive and phase-resetting models, University of Leicester, 2020**

ERPs were simulated based on Additive and Phase-resetting models (conventional models of the neural basis underlying ERP generations) and a phase-resetting index (PRI) was measured for each simulated average ERP. **Linear Discriminant Analysis** was implemented using **MATLAB**. The algorithm considered all (but one) of the simulations and then guessed the model used to generate the remaining simulation based on its  values. For validation of decoding performance, we used a leave-one-out cross-validation. The *p* value of the decoding performance was estimated by comparing the number of hits to those obtained from a binomial distribution under the assumption of chance guessing. Analysis of decoding performance revealed 93.57% which was significantly larger than chance at the *p*<0.001 level.

**Classifying ERP responses in a conscious face perception task, University of Leicester 2013**

For each subject, ERP responses to faces and non-faces stimuli were classified using **Linear Discriminant Analysis** as explained above. Decoding performance was significantly higher than chance for most subjects (18 out of 22, *p*<0.05), with a mean decoding performance of 60.1% (SD 4.2%).

**PUBLICATIONS**

**Maryam Ahmadi**, Denoising improves visualization of evoked potentials with limited number of trials (2020). Journal of Clinical Neuroscience 75, 213-217

Negin Sattari, Lauren Whitehurst, **Maryam Ahmadi**, Sara C. Mednick, Does working memory improvement benefit from sleep in older adults? (2019) Neurobiology of Sleep and Circadian Rhythms 6, 53-61

**Maryam Ahmadi**, Elizabeth A. McDevitt, Michael A. Silver, Sara C. Mednick, Perceptual learning induces changes in early and late visual evoked potentials (2018). Vision Research 159, 101-109

Negin Sattari, Elizabeth A. McDevitt, Dagmara Panas, Mohammad Niknazar, **Maryam Ahmadi**, Mohsen Naji, Fiona C. Baker, Sara C. Mednick, The Effect of Sex and Menstrual Phase on Memory Formation during Nap (2017). Neurobiology of Learning and Memory 145, 119-128

E McDevitt**, M Ahmadi**, M Silver, S Mednik, Modulating acetylcholine during consolidation of sleep-dependent perceptual learning (2016). Journal of Vision (12) 550-550

N Sattari, EA McDevitt, M Niknazar, **M Ahmadi**, SC Mednick, Menstrual cycle may affect sleep-dependent memory consolidation via variation in thalamocortical synchrony (2016). Journal of Sleep Research 25, 301-301

Hernan Gonzalo Ray, **Maryam Ahmadi** and Rodrigo Quian Quiroga, Single trial analysis of field potentials in perception, learning and memory (2015). Current Opinion in Neurobiology, 31: 148-155

RC Caruso, RQ Quiroga**, M Ahmadi**, S Kastner, De-noising the ISCEV standard VEP using wavelet transforms (2014). 2014 Symposium of the International Society for Clinical Electrophysiology of Vision (ISCEV)

**M. Ahmadi**, R. Quian Quiroga (2013) Automatic denoising of single-trial evoked potentials. Neuroimage 66:672-680

J. Navajas, **M. Ahmadi**, R. Quian Quiroga (2013) Uncovering the Mechanisms of Conscious Face Perception: A Single-Trial Study of the N170 Responses. Journal of Neuroscience 33:1337-1343

**M. Ahmadi**, M. Ayat, K. Assaleh, H. Al-Nashash (2008) Fetal ECG Signal Enhancement using Polynomial Classifiers and Denoising. Proceedings of the 2008 IEEE, CIBEC'08

**WORKING MANUSCRIPT**

**Maryam Ahmadi**, Sara C. Mednick, Elizabeth A. McDevitt, Latency correction of even-related potentials to examine amplitude modulation of successive components (Submitted to MethodsX)

**Maryam Ahmadi,** A new method to differentiate the origins of event-related potentials (in preparation)

**Maryam Ahmadi**, Elizabeth A. McDevitt, Michael A. Silver, Sara C. Mednick, Neural correlates of memory consolidation during sleep and wakefulness (in preparation)

**CONFERENCE PRESENTATIONS**

N.Sattari, E.A.MaDevitt, M. Niknazar, M.Ahmadi, S.C.Mednick “Dose Sleep Or Wake Benefit Working Memory in Older Adults?” Sleep, Boston, USA. June 2017

**Maryam Ahmadi**, Elizabeth A. McDevitt, Michael A. Silver, Sara C. Mednick “The effects of cholinergic enhancement during sleep-dependent consolidation of visual perceptual learning: An ERP study”. Sleep, Denver, USA. June 2016

Elizabeth A. McDevitt, **Maryam Ahmadi**, Michael A. Silver, Sara C. Mednick “Modulating acetylcholine during sleep consolidation”. Sleep, Denver, USA. June 2016

N.Sattari, E.A.McDevitt, M.Niknazar, **M.Ahmadi**, S.C.Mednick “ That time of the month: The effect of menstrual cycle on sleep-dependent memory consolidation”. Denver, USA. Sleep 2016

N.Sattari, E.A.McDevitt, M.Niknazar, **M.Ahmadi**, S.C.Mednick “Menstural cycle may affect sleep-dependent memory consolidation via variation in thalamocortical synchrony”. European Sleep conference 2016

Elizabeth A. McDevitt, **Maryam Ahmadi**, Michael A. Silver, Sara C. Mednick“Modulating acetylcholine during consolidation of sleep-dependent perceptual learning”. Vision Sciences Society, VSS, Florida, USA. May 2015

**M. Ahmadi**, R. Quian Quiroga “Single-trial event-related potentials with automatic wavelet denoising”. British Neuroscience Association, BNA, London, UK. April 2013

**M. Ahmadi**, R. Quian Quiroga “Single-trial event-related potentials with automatic wavelet denoising”. 8th FENS Forum of Neuroscience, Barcelona, Spain. July 2012

J. Navajas, **M. Ahmadi**, R. Quian Quiroga “Decoding conscious perception of faces with single trial N170”. 8th FENS Forum of Neuroscience, Barcelona, Spain. July 2012

**M. Ahmadi**, R. Quian Quiroga “Single-trial event-related potentials with automatic wavelet denoising”. Festival of Postgraduate Research, Leicester, UK. May 2012

J. Navajas**, M. Ahmadi**, R. Quian Quiroga “Decoding conscious perception of faces with single trial

N170”. Leicester Neuroscience Day, Leicester, UK. March 2012

**M. Ahmadi**, R. Quian Quiroga “Single-trial event-related potentials with automatic wavelet denoising”. XI International Conference on Cognitive Neuroscience, ICON XI, Mallorca, Spain. September 2011

**REVIEWING**

Journal of Neuroscience Methods

Frontiers in Human Neuroscience