Homa Rashidisabet

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EDUCATION

University of Illinois at Chicago (UIC), Chicago, IL   Fall 2018 - (Expected) Fall 2023

Ph.D. in:	Bioengineering
Areas of research:	Machine Learning and Statistics in health-focused problems

University of Tehran (UT), Tehran, Iran   Fall 2012 - Fall 2016

B.Sc. in:	Applied Mathematics
Thesis:	Dynamical Systems in Neuroscience

WORK EXPERIENCE

The Janssen Pharmaceutical Companies of Johnson and Johnson (JnJ)   May 2020 - Sep 2020

— Worked as an R&D data scientist intern in a cross-functional team to pre-process and engineer sensor data collected through wearable devices to develop personalized predictive models for detecting individuals' anomalous behavior (i.e., depression relapse) using deep learning methods.

CoNECt Lab, UIC   Jan 2019 - Jan 2021

— Worked as a research assistant to examine the ubiquitous 'virtual mental-health footprints' or 'signatures' of anomalies in people suffering from mood disorders as well as investigating the association of the depression severity, and age on the engineered features from the typing dynamics data collected through **BiAffect** mobile health application using Machine Learning and Statistics.

— Collaborated with a highly interdisciplinary team of specialists in statistics, psychiatry, mathematics, computer science, and data science to maintain and improve the BiAffect application and its data collection process.

Laboratory of Product and Process Design, UIC   Aug 2018- Jan 2019

— Worked as a research assistant on processing medical images and solving large-scale systems of equations via numerical optimization methods for dynamic simulation of the blood flow and pressure in human brain vasculature (cerebral arterial trees).

Teaching assistant, UIC

— Biostatistics (BIOE 339)   Spring 2019
— Elastography (BIOE 594)   Fall 2020
— Physiological Modeling Data and Systems (BIOE 240)   Fall 2019 - Spring 2020

Teaching assistant, UT

— Theory of Differential Equations   Fall 2015

PUBLICATION

Journal Papers

— *A systems biology approach to the digital behaviorome.* **Rashidisabet, H**., Thomas, P., Ajilore, O., Zulueta, J., Moore, R., Leow, A. Current Opinion in Systems Biology. 2020 Jul 7. **Link**.   Fall 2020

— *Effects of mood and aging on keystroke dynamics metadata and their diurnal patterns in a large open-science sample: A BiAffect iOS study.* Vesel, C., **Rashidisabet, H**., Zulueta, J., Stange, J., Duffecy, J., Hussain, F., Piscitello, A., Bark, J., Langenecker, S., Young, S., Mounts, E., Omberg, L., Nelson, P., Moore, R., Koziol, D., Bourne, K., Bennett, C., Ajilore, O., Demos, A., Leow, A. Journal of the American Medical Informatics Association (2020). **Link**.https://doi.org/10.1093/jamia/ocaa057   Spring 2020

Work in Progress

— *A deep-learning-based anomaly detection method for unobtrusive detection of depression relapse from in-the-wild actigraphy sensor data.* Narayan, V., Li, Q., Vairavan, S., **Rashidisabet, H**., Raghavan, N. ()In a collaboration with JnJ   Summer 2020

— *A statistical method for identification of multiple underlying generative distributions of in-the-wild human typing dynamics: a framework for developing a digital biomarker for mood prediction.* **Rashidisabet, H**., Zulueta, J., Langenecker, S., Moore, R., Ajilore, O., Leow, A., and Demos, A.   Fall 2020

REVIEWER

— NewInML at NeurIPS 2020. **Link**.   Since Sep 2020

RESEARCH EXPERIENCE	**Feature engineering and data pre-processing**	
	— Employed entropy analysis, supervised and unsupervised learning, and data mining methods to engineer clinically relevant features from keystroke dynamics metadata and other sensor information within **Bi-Affect** (smartphone health application) across different diagnostic groups (**Link** to the resulting poster).	Feb 2019 - Apr 2019
	— Developed algorithms and pipelines for engineering non-trivial features from sleep/awake periods using the raw accelerometer data collected through actiwatch wearables (resulted in an internal poster presented at the annual QS 2020 Conference at JnJ and a working paper).	May 2020 - Sep 2020
	Multivariate time-series anomaly detection	
	— Developed a hybrid method for detecting personalized depression relapse by integrating the state-of-the-art Deep Learning methods (e.g., LSTM, LSTM-encoder-decoder) with an existing unsupervised and nonparametric anomaly thresholding approach using sensor actigraphy data (resulted in a working paper in collaboration with JnJ company).	Since May 2020
	Learning naturalistic human typing dynamics behavior	
	— Developed a statistical method to model multiple underlying generative distributions of the naturalistic human typing dynamics data, and developed a potential digital biomarker (clinically relevant feature) for mood prediction using the proposed method (resulted in a **close-to-submission journal paper**, and a poster. **Link** to the poster).	Since Mar 2020
	Association study through statistical models	
	— Employed statistical methods to show unobtrusively collected keystroke dynamics metadata is significantly associated with mood despite diurnal patterns and effects of age and thus could serve as a foundation for constructing digital biomarkers (**Link** to the resulting paper, and **Link1**, **Link2** to the resulting posters).	Feb 2019 - May 2020
	Image processing	
	— Image processing (e.g., segmentation, reconstruction, filtering, object-recognition, classification, dimensionality reduction) using medical MRI/MRE images as well as **MIT face recognition project** dataset via convolutional neural networks (CNN), K-nearest neighbors (KNN), Gradient boosting, principal component analysis (PCA), and two-dimensional discrete Fourier series.	Aug 2018 - Jan 2019

POSTER PRESENTATION	— *Characterizing Passively Collected Real-World Keyboard Dynamics in Mood Disorders as a Function of Age and Time-of-Day.* **Rashidisabet, H.**, Vesel, C., Demos, A., Bennett, C., Zulueta, J., Stange, J., Duffecy, J., Hussain, F., Piscitello, A., Bark, J., Langenecker, S., Young, S., Mounts, E., Omberg, L., Nelson, P., Moore, R., Ajilore, O., Leow, A. Biological Psychiatry 87.9 (2020): S150. Poster e-presented (due to Covid-19 pandemic) at the 2020 Society of Biological Psychiatry (SOBP). **Link**
	— *Diurnal Patterns as Evidenced by Over Eleven Million Smartphone Keystrokes During Daily Usage: An iOS BiAffect Study.* Vesel, C., **Rashidisabet, H.**, Demos, A., Zulueta, J., Stange, J., Duffecy, J., Hussain, F., Piscitello, A., Bark, J., Langenecker, S., Young, S., Mounts, E., Omberg, L., Nelson, P., Moore, R., Ajilore, O., Leow, A. Poster presented at the 11th Annual National Network of Depression Centers Conference; 2019 Sept 24-25; Ann Arbor, MI. **Link**, and was selected as a **travel award poster**. Also, the poster presented at the ACNP 58th Annual Meeting: Poster Session II. Neuropsychopharmacol. 44, 230–384 (2019). **Link**.
	— *Complexity of keyboard dynamics in bipolar disorder: A BiAffect digital phenotyping study.* Bark, J., Demos, A.P., Zulueta, J., Stange, J., Duffecy, J., Hussain, F., Piscitello, A., Vesel, C., **Rashidisabet, H.**, Langenecker, S., Young, S., Mounts, E., Omberg, L., Nelson, P., Moore, R.C., Ajilore, O., Leow, A. Poster presented at the 2019 Society of Biological Psychiatry (SOBP). Chicago, IL.
	— *The CAN-BIND Collaborative Study: Replicating Models of MDD Relapse: The Challenges and Opportunities of Digital Biomarkers.* Li, Q., Raghavan, N., **Rashidisabet, H.**, Vairavan, S., Narayan, V., Kennedy, S. Poster presented at the internal QS 2020 Conference at JnJ company.

AWARD AND HONOR	— Doctoral scholarship, Bioengineering Department, UIC, Chicago, IL.	Since Fall 2018
	— Governmental scholarship, Department of Mathematics, Statistics and Computer Science, UT, Iran.	2012 - 2016
	— Ranked top 0.5% among more than 500,000 participants of the national university entrance exam, Iran.	Fall 2012

TECHNICAL SKILL	Programming language:	Fluent in Python, and R. Experienced in C++, and Java
	Python package:	NumPy, Pandas, SciPy, scikit-learn, Keras, PyOD, Matplotlib
	R package:	dplyr, corrplot, psych, caret, logspline, fitdistrplus, lme4, lmerTest
	Software:	Matlab, Tableau, Microsoft Office, RapidMiner