

Larry Zhang B.S.
Curriculum Vitae

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Education

2020 - Present

Indiana University, Bloomington
Dual PhD in Intelligent Systems Engineering
and Complex Network Systems
NSF-NRT Fellowship Awardee

2013 - 2017

University of California, San Diego
BS in Electrical Engineering (specialization
in Machine Learning and Controls)

Academic Positions & Training

May 2021 - Present

Indiana University, Complex Network Systems
Research Assistant (PI: YY Ahn, Co-Advisor)

February 2021 - Present

Indiana University, Cognitive Science
Research Assistant (PI: Michael N. Jones)

July 2020 - Present

Indiana University, Intelligent Systems Engineering
Research Assistant (PI: Greg Lewis, Co-Advisor)
Research Assistant (PI: Katy Börner)

February 2020 - July 2020

USC, Institute for Creative Technologies
Project Assistant (PI(s): Mohammad Soleymani, Stefan Scherer)

September 2018 - July 2019

Stanford University, Department of Psychology
Research Assistant (PI: Ian Gotlib, Post-Doc: Tiffany Cheing Ho)

April 2018 - June 2019

University of Washington - Seattle, Department of Neurology
Research Manager (PI: Reza Hosseini Ghomi)

September 2016 - June 2017

UC San Diego, Department of Electrical Engineering
Undergraduate Researcher (PI: Kenneth Kreutz-Delgado)

Funding

August 2020 - August 2022

NSF-NRT in Complex Network Systems Fellowship
Funding for Graduate Studies
\$34,000 stipend per annum

Awards

July 2019

Young Investigator Award, *Sage Assembly hosted by Sage Bionetworks*

Ongoing Projects

Reference Organ Visualization (Brain)

Predictive Models of Semantic Memory Search

Tensor Decomposition of Edge Time Series in Functional Brain Connectivity

Vocal Analysis of Schizophrenia Patients with Oxytocin Intervention

Synchrony of Heart Rate Variability and Movement Behavior in Intimate Disclosure

Publications

Accepted, in press, or published

* co-first authors

7. **Zhang L***, Ngo AD*, Burkhardt HA, Thomas JA, Rhoda Au, Hosseini Ghomi R; Neuropathological Test Validation of Speech Markers of Cognitive Impairment (2021). *Exploration of Medicine*. (<https://doi.org/10.37349/emed.2021.00044>)
6. Tavabi L, Stefanov K, **Zhang L**, Borsari B, Woolley JD, Scherer S, Soleymani M; Multimodal Automatic Coding of Client Behavior in Motivational Interviewing. *22nd International Conference on Multimodal Interaction* (2020) (<https://dl.acm.org/doi/10.1145/3382507.3418853>)
5. **Zhang L**, Duvvuri R, Konda Lakshmi Chandra K, Nguyen T, Hosseini Ghomi R (under review); Automated Voice Biomarkers for Depression Systems using an Online Cross-Sectional Data Collection Initiative (2020). *Depression and Anxiety*. (<https://doi.org/10.1002/da.23020>)
4. Thomas JA, Burkhardt HA, Chaudhry S, Ngo AD, Sharma S, **Zhang L**, Au R, Hosseini Ghomi R; Assessing the Utility of Language and Voice Biomarkers for Alzheimer's Disease: Predicting Neuropsychological Measures and Dementia Status in the Framingham Heart Study Cognitive Aging Cohort (2020). *Journal of Alzheimer's Disease*. (<https://doi.org/10.3233/JAD-190783>)
3. Phi H, Janarthanan S, **Zhang L**, Hosseini Ghomi R; Voice Biomarker Identification for Effects of Deep-Brain Stimulation on Parkinson's Disease (2020) (<https://arxiv.org/abs/1912.00866.pdf>)
2. **Zhang L**, Driscoll J, Chen X, Hosseini Ghomi R; Evaluating Acoustic and Linguistic Features of Detecting Depression Sub-Challenge Dataset (<https://doi.org/10.1145/3347320.3357693>). *AVEC 2019 9th International Audio/Visual Emotion Challenge and Workshop, ACM Multimedia 2019*
1. **Zhang L**, Chen X, Vakil A, Byott A, Hosseini Ghomi R; DigiVoice: Voice Biomarker Featurization and Analysis Pipeline (2019) (<https://arxiv.org/abs/1906.07222>).

Preprints/Manuscripts Submitted, Under Revision, or Under Review

* co-first authors

1. **Zhang L**, Scherer S, Soleymani S; Linking Psychological Distress Symptoms and Behaviors: A Multimodal Information Gain Analysis (2021).

Preprints/manuscripts in preparation

* co-first authors

2. **Zhang L** , Chandio BQ, Börner Katy; Cross-Mapping Anatomical Brain Atlases in MNI Space for Tissue Registration (2021).

1. **Zhang L**, Castro N, Cohen T, Hosseini Ghomi R; Open questions in estimating cognitive status based on verbal fluency networks.

Conference Presentations

* co-first presenters

3. **Zhang L**, Castro N, Cohen T, Hosseini Ghomi R; *Challenges in Estimating Dementia via Verbal Fluency Networks*. Poster Presented at Annual Meeting of the Psychonomics Society 2020.

2. **Zhang L**, Castro N, Cohen T, Hosseini Ghomi R; *Probing Speech Generation via Semantic Fluency Networks in Aging Populations as a Proxy of Dementia and Alzheimer's Disease*. Oral Presentation at NetSci-X 2020, Tokyo, Japan.

1. Walker J*, **Zhang L***, Hosseini Ghomi R, Gotlib IH, Ho TC (2019) *Acoustic Vocal Features in the Subtyping of Adolescent Depression using Machine Learning*. Poster presented at the Annual Meeting of the Society of Biological Psychiatry, Chicago, IL.

Reviewing and Service

Reviewer, BMC BioData Mining

2021

Professional Affiliations

April 2019 - March 2020

Neurolex Diagnostic Laboratories

Neurolex Research, Research Manager

March 2018 - April 2019

Nvidia Corporation

Mixed Signal Design Validation Team, Engineer

Open Source Contributions

Digivoice Voice Analysis Pipeline:

<https://github.com/NeuroLexDiagnostics/Voice-Analysis-Pipeline>

DigiPsych Prosodic Feature Extraction:

https://github.com/NeuroLexDiagnostics/DigiPsych_Prosody

Technical Skills

Analysis Modules: TensorFlow, Keras, Pytorch, Sci-kit Learn, Numpy, StatsModels, Pandas, Apache Spark, NetworkX, Tensorly

Database Softwares: MySQL, Postgres

Visualization Modules: Vega, Altair, Vega-Lite, Plotly, Seaborn, Matplotlib

Programming: Python, C, C++, Java, CSS, HTML, UNIX Bash

Teaching and Mentorship

Masters Students

Kiranmayi Konda Lakshmi Chandra (M.Sc. 2020); Currently Software Engineer at TEKsystems

Undergraduate Students

Anthony Dinh Ngo (B.Sc. 2022); Currently Data Science Intern at Allstate

Sungmin Park (B.Eng. 2021); Incoming WUSTL PhD in Imaging Science

Kathleen Williams (B.Sc. 2021); Incoming University of Cincinnati PhD in Biomedical Informatics

Ali Byott (B.Sc. 2021); Incoming Cloud Software Engineer at Oracle

Sanjeev Janarthanan (B.Sc.2020) Currently Data Analyst at Princeton Neuroscience Institute

Abbad Vakil (B.Sc. 2020); Currently Software Development Engineer at Amazon

Anthony Driscoll (B.Sc. 2019); Currently Fulbright Student Scholar at NVE

Sherry (Xiaotong) Chen (B.Sc. 2019); Currently UCSB PhD in Computer Science

High School Students

Ethan Cantrell (2021); Currently Incoming Bioengineering Student at Georgia Tech