Tianyu Zhang

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EDUCATION

University of California, San Diego *Sept.2015 - Present*
B.S, Mathematics
B.S, Cognitive Science with Specialization in Machine Learning and Neural Computation
Major GPA: **3.91/4.0** Overall GPA: **3.73/4.0** Provost Honors 2015, 2016, 2017

Highlighted Mathematics Coursework: Applicable Math and Computing, Intro/Math Statistics, Intro/Stochastic Processes, Foundations/Real Analysis, Intro. to Statistical Analysis, Linear Algebra, Abstract Algebra, Introduction to Probability, Mathematical Reasoning

Highlighted Cognitive Science Coursework: Distributed Cognition, Neural Signal Processing, Brain Computer Interfaces, Sensation and Perception, Language

Highlighted Data Science Couresework: Introduction to Data Science, Data Science in Practice, Data Analysis and Inference

Highlighted Computer Science Coursework: Intro to Machine Learning, Intro Programming MATLAB, Introduction to Computing, Intr/Computer Sci & Obj-Ori:Java, Interaction Design

RESEARCH EXPERIENCE

Voytek Lab, UCSD, Undergraduate Researcher Advisor: **Bradley Voytek**
Pre-stimulus Event Related Potential(ERP) Effect *Mar.2018 - Present*

- Collected data from online datasets (sample datasets from mne and from the VEPESS dataset) and participated in collecting electroencephalogram data of several UCSD students
- Cleaned data using PCA and Autoreject and Processed data:
  - Applied general alpha band width filter to the data, from 8Hz to 12Hz
  - Used Hilbert transform to transfer the data from time domain to phase domain
  - Did the epoch around each event, which is select 1s of data around each event
- Evaluated the relationship between pre-stimulus phase (phase before the event happens, usually about 0.1ms) and ERP. This relationship belongs to circular-linear statistics.
- Obtained **95** % confidence from the statistical results, showing pre-stimulus phase has impact on ERP in the specific ERP related experiments. (Within certain pre-stimulus phases would lead to a higher possibility of ERP)

INTERNSHIP EXPERIENCE

iFlytek, Data Engineer Intern *Summer 2017*

- Individually developed a teacher recommendation system with Python, Spark and Hive for high school students
- Organized hundreds of features of student activities in an education application
- Read papers of image analysis and computer vision on education videos used in a classroom, specifically identifying and recording actions from students and teachers

ING Shanghai, Data Analyst Intern *Summer 2016*

- Analyzed seasonal financial reports from different listed companies
- Built a tool to increase efficiency of financial data analysis for the group, easier to cross-check data between different tables

SELECTED COURSEWORK

CSE 170 Interaction Design

- Accomplished an interaction design of WeOrder, a web app for college students to order food online with personalized allergic settings
- Implemented critical prototype features and UI design, conducted UI tests on all pages and implemented features on platform, applied new changes to code base / UI with users' feedback
- Created version B of prototype to test against default design, analyzed comparative evaluation results and finalized UI for best user experience possible

COS 189 Brain Computer Interface

- Researched the core steps of Brain Computer Interface driven speller system: signal acquisition, preprocessing or signal enhancement, feature extraction, classification and control interface
- Studied the function of P300 wave, an ERP component during the decision making in brain communication system
- Compared the performance (accuracy, flexibility and efficiency) of different models of BCI spellers including Farwell-Donchin paradigm, Region-based P300 speller and The Hex-o-Spell

COGS 118A Intro to Machine Learning I

- Researched on the comparison between Different Classification Algorithms including SVM, K-nearest neighbors, Logistic Regression, Bagging, and Multilayer Perceptron
- Conducted experiments with three datasets, displayed and analyzed the average accuracies of each algorithm applied onto different datasets under different splits

COGS 118B Intro to Machine Learning

- Applied K-means and CNN on MNIST dataset, optimized the obtained the accuracy of each model on testing set
- Made a video presentation to analyze the different accuracy of K-means (85%) and CNN (99%)

COGS 108 Data Science in Practice

- Statistically tested our hypothesis of a research question: Are Universities Worth the Opportunity Cost, and analyzed the correlation between opportunity cost and salaries
- Collected data from official dataset (from data.gov; containing over 7,000 higher education institutions with in the US), cleaned the data and built the regression model via Python
- Analyzed with the evaluation index including income after 5 years and 10 years, projected aggregated income at age 30, age 40 and potential average income in different major

Math 189 Data Analysis and Inference

- Applied Xgboost algorithm to predict how popular an apartment rental listing is based on the listing contents like text description, photos, number of bedrooms, price, etc. on Kaggle

TEACHING & SERVICE

Instructional Apprenticeship, UCSD CogSci Department *Winter 2018*

- Graded assignments and final projects of students in COGS 108 Data Science in Practice.
- Designed instructional materials with TAs and co-leaded the discussion sections

Technical Director, Chinese Union, UCSD *2016 - 2017*

- Developed and maintained a new website (especially the Web front-end development and data maintenance) for Chinese Union (1000+ membership). **www.chineseunion.org**

TECHNICAL STRENGTHS

Programming Languages: Python, R, Matlab, HTML, CSS
Tools & Techniques: Spark, Hive