Chunji Wang

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EDUCATION

- **University of Southern California** — Los Angeles, CA
  Ph.D. in Neuroscience — *Jul. 2011 – Aug. 2017*

- **Tsinghua University** — Beijing, China
  Bachelor of Science in Physics — *Jul. 2007 – Jul. 2011*

SKILLS

- **Theories**: Machine Learning, Statistics, Natural Language Processing (NLP), Deep Learning, Scientific Computing
- **Languages**: Python, R, Matlab, SQL, Java, Mathematica, C#, C++
- **Technologies**: Git, Shiny, MySQL, Spark, Kinect, CKAN, AWS, Linux

WORK EXPERIENCE

- **Innovation Solutions** — Santa Ana, CA
  Data Scientist Intern — *Summer 2015 & Spring 2016*
  - **Summary**: Developed applications to record, analyze and report human movement kinematics and performance during Kinect video games and exercises.
  - **Data Acquisition**: Implemented an application body-recorder to acquire Kinect skeleton data and smooth it with an Unscented Kalman Filter (Matlab & C#). $\sim 90\%$ of noise and spikes are filtered out.
  - **Data Analysis**: Implemented an application to calculate human anatomical joint angles from Kinect skeleton data (Matlab & C#), allowing further analysis of human movement patterns in anatomical terms.
  - **Report and Visualization**: Designed and implemented a web application to report full kinematics performance history to users and physical therapists (R, Shiny & SQL) with intuitive graphics.

- **SixThirty Incubator** — Pasadena, CA
  Data Scientist — *Jul 2015 – Aug 2016*
  - **CKAN**: Set up CKAN Open Source Data Portal Platform in Linux environment; Deployed the platform onto AWS Cloud and Google Cloud, enabling SixThirty to publish and share datasets.

RESEARCH PROJECTS

- **Human Movement Analysis:**:
  - **Movement Planning**: Simulated human arm movement in state space via Optimal Control theory implemented by iterative Linear-Quadratic Regulator and Dynamic Programming in Matlab; Showed that a moderate movement velocity achieves the best accuracy.
  - **Movement Learning**: Analyzed 10+GB upper extremity kinematics data via Matlab, R, and SQL; Extracted movement patterns and variability patterns via PCA and other dimension reduction methods; Unraveled the relationship between movement patterns and movement learning.
  - **Movement Learning Prediction**: Developed dynamical State Space Model with Mixed Effects to investigate the effects of rehabilitation training, allowing customization of training schedule and prediction of future performance for each individual.

- **Customer Churn Prediction**: Developed regression, tree-based, and KNN algorithms to predict customer churn probability based on labeled data via Python and Spark. Achieved more than 90% accuracy.

- **Word Prediction**: Developed an application wordpred to predict the most likely following word in real time while a user is typing. Tokenized 2GB text data to train an ngram model. Deployed via Shiny framework.

- **Topic Modeling**: Grouped unlabeled textual documents and inferred latent semantic structures via Python. Extracted features by Term Frequency - Inverse Document Frequency (TF-IDF). Trained K-means and Latent Dirichlet Allocation(LDA) models. Identified latent topics and keywords of each document for clustering and calculated document similarity. Visualized results by Principal Component Analysis (PCA).

- **Customized Vocabulary Review**: Wrote an Anki add-on vocabulous to automatically generate vocabulary cards for review with one click. The add-on extracts new words from Google Search History via "define" keyword; queries definitions through Oxford Dictionary API.

PUBLICATIONS

- **Wang C** et al. Spin-orbit coupled spinor Bose-Einstein condensates. *Physical Review Letters.* 105, 160403
- **Wang C** et al. The duration of reaching movement is longer than predicted by minimum variance. *Journal of Neurophysiology.* Vol.116 no.5, 2342-2345
- Martinez C, **Wang C**. Structural constraints on learning in the Neural Network. *Journal of Neurophysiology.* Vol.114 no.5, 2555-2557