Chunji Wang

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EDUCATION

University of Southern California — Los Angeles, CA
Ph.D. in Neuroscience; Published 2 top-journal articles — *Jul. 2011 – Aug. 2017*

Tsinghua University — Beijing, China
Bachelor of Science in Physics; Published 1 top-journal article — *Jul. 2007 – Jul. 2011*

WORK EXPERIENCE

Innovation Solutions — Santa Ana, CA
Product Development Engineer Intern — *Summer 2015 & Spring 2016*

- **Summary**: Worked with software engineer team to develop applications to record, analyze, report human (healthy and post-stroke individuals) movement performance during Kinect video games and exercises
- **Data Acquisition and Smoothing**: Implemented an application to acquire Kinect skeleton data, smooth it with a spike removal filter and an Unscented Kalman Filter (Matlab & C#)
- **Human Joint Angle Inference**: Implemented an application to calculate human anatomical joint angles from Kinect skeleton data (Matlab & C#)
- **Web Application**: Designed and implemented a web application to report full kinematics performance history to users and physical therapists (R, Shiny & SQL)

DATA SCIENCE PROJECTS

- **Customer Churn Prediction in Telecommunication Industry**:
  - **Summary**: Developed algorithms to predict customer churn probability based on labeled data via Python and Spark
  - **Models**: Trained supervised learning models, including Logistic Regression, Random Forest and KNN with parameter regularization
  - **Evaluation**: Evaluated model performance via k-fold cross validation and confusion matrix
  - **Feature selection**: Analyzed feature importance to identify most significant factors

- **Natural Language Processing and Topic Modeling**:
  - **Summary**: Clustered unlabeled textual documents into groups and inferred latent semantic structures via Python
  - **Preprocessing**: Preprocessed text by tokenizing, stemming and stopwords removing, and extracted features by Term Frequency-Inverse Document Frequency (TF-IDF) approach
  - **Models**: Trained unsupervised learning models: K-means Clustering and Latent Dirichlet Allocation (LDA)
  - **Results**: Identified latent topics and keywords of each document for clustering and calculated document similarity
  - **Visualization**: Visualized results by Principal Component Analysis (PCA)

RESEARCH PROJECTS

- **Human Movement Simulation**: Simulated human arm movement in state space with 2-link arm model, via Optimal Control theory implemented by iterative Linear-Quadratic Regulator and Dynamic Programming in Matlab to investigate how movement accuracy affects velocity

- **Human Movement Performance Analysis**: (1) Analyzed 5+GB kinematics data from Armeo@Spring in csv files from 50+ users in Matlab; and (2) Organized 5+GB kinematics data from 40+ users in text files format into mySQL database (therefore increased efficiency by 1000 folds) and analyzed in R to investigate how movement patterns correlate with stroke recovery

- **Human Movement Performance Modeling**: Developed dynamical State Space Model with mixed effects to investigate the effects of rehabilitation training, to customize training schedule and predict future performance for each individual

PROGRAMMING SKILLS

- **Languages**: R, Python, Java, C#, C++, SQL, Matlab, Mathmetica

- **Technologies**: Git, Shiny, mySQL, AWS, Kinect, CKAN, Heroku