XIAYI (SHERRY) WANG

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EDUCATION

Ph.D. in Applied Mathematics and Computational Science **August 2015**

University of Iowa, Iowa City, Iowa, United States Advisor: Dr. Bruce P. Ayati

Concentration: Mathematical Biology

Master in Biostatistics **May 2015**

University of Iowa, Iowa City, Iowa, United States

Master in Mathematics **July 2009**

Sichuan University, Chengdu, China

Bachelor in Mathematics **July 2006**

Sichuan University, Chengdu, China

RESEARCH EXPERIENCE

Research Postdoctoral scholar **December 2015 - December 2017**

Human Brain Research Laboratory / Math Department, University of Iowa, Iowa City, Iowa

- Designed experiments to understand human auditory perception.
- Processed and structured large-scale datasets for analysis.
- Ran a battery of hypothesis tests on neural-behavioral data.
- Built a machine learning pipeline to predict human perception states.
- Identified brain regions contributing to the auditory perception task, and presented findings at international conferences.
- **Tools:** Python, MATLAB, HPC, SVM(LIBSVM), PCA.

Research and development Intern **August 2015 - December 2015**

IDx LLC, Iowa City, Iowa

- Applied deep learning to diagnose blindness in diabetes patients.
- Designed efficient algorithms to rank retinal image quality.
- Modified deep learning software (Caffe) to manage custom datasets.

- Trained convolutional neural networks to quantify image quality in real-time.
- **Tools:** SQL, Python, C++, Caffe, HDF5.

Research Assistant **January 2013 - August 2015**

Orthopedics Biology Laboratory, University of Iowa, Iowa City, Iowa

- Proposed multi-scale predictive models of cartilage degeneration.
- Co-developed a C++ toolkit to simulate the predictive models.
- Applied image processing on microscope photos to extract data.
- Validated the models using spatiotemporal statistical analysis.
- Discovered biomarkers for early diagnosis of osteoarthritis.
- **Tools:** MATLAB, C++, HPC, R, numerical differential equations.

TEACHING EXPERIENCE

Teaching Assistant **August 2009 - January 2013**

Math Department, University of Iowa, Iowa City, Iowa

- Math for Business, Math for Biology, and Calculus I \& II.
- Designed discussion sections, organized lectures, weekly grade homewards and held office hours.

REU program **summer 2011**

- Lecture: Basic Computer Programming for Scientific Research.
- Led student research project on bone modeling; advice on project designing, model simulation and final presentation.

SKILLS

Programming Skills:

General: C/C++, Python

Scientific: MATLAB, R, SAS

Other: UNIX/Linux, Windows, HPC, Git, LaTeX

Quantitative Skills:

Statistical Analysis: regression, categorical & survival analysis, time series, clinical trials

Mathematical Modeling: mathematical biology, numerical differential equations

Machine Learning: classification algorithm, cluster analysis, deep learning (CNN)

PUBLICATIONS

Quynh-Ahn Nguyen, **Xiayi Wang**, John Rinzel, and Rodica Curtu, Perceptual Alternation in Auditory Streaming as An Evidence Accumulation Process (In progress).

Xiayi Wang, Rodica Curtu, Bingni W. Brunton, and Kirill V. Nourski, Neural signatures of auditory perceptual bistability revealed by large-scale human intracranial recordings. The journal of neuroscience (under review).

Kirill V. Nourski, Matthew I. Banks, Ariane E. Rhone, Mitchell Steinschneider, **Xiayi Wang**, Hiroto Kawasaki, and Matthew A. Howard 3rd, Electrocorticographic investigation of auditory predictive coding in the human brain across levels of consciousness. Advances and Perspectives in Auditory Neurophysiology. November 10, 2017, Washington, DC.

Georgi I. Kapitanov, **Xiayi Wang**, Bruce P. Ayati, Marc J. Brouillette, and James A. Martin, Linking Cellular and Mechanical Processes in Articular Cartilage Lesion Formation: A Mathematical Model, Frontiers in Bioengineering and Biotechnology, 4(80), 2016. DOI: https://www.frontiersin.org/articles/10.3389/fbioe.2016.00080/full

Xiayi Wang, Marc J. Brouillete, Bruce P. Ayati, and James A. Martin, A Validated Model of the Pro- and Anti-inflammatory Cytokine Balancing Act in Articular Cartilage Lesion Formation, Frontiers in Bioengineering and Biotechnology, 3(25), 2015. DOI: http://dx.doi.org/10.3389/fbioe.2015.00025.

Xiayi Wang, Bruce P. Ayati, Marc J. Brouillette, Jason M. Graham, Prem S. Ramakrishnan, and James A. Martin, Modeling and Simulation of the Effects of Cyclic Loading on Articular Cartilage Lesion Formation, Intl. J. for Numerical Methods in Biomedical Engineering, 30(10), 2014, pp. 927-941. DOI: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4950512/.

ACTIVITIES

Presentations and Conferences

- Poster presentation at Society for Neuroscience 2016 Annual Meeting (SFN)
  San Diego, CA, USA — November 12-16, 2016
- Invited talk at 2016 International Conference on Brain Informatics & Health (BIH)
  Omaha, Nebraska, USA — October 13-16, 2016
- Joined the 10th Annual Summer Neuro Workshop supported by NSF
  University of Missouri-Columbia, MO, USA — May 23-27, 2016
- Invited talk at third Annual Midwest WIMS conference
  Chicago. IL , USA — October 2014

Certifications

- Venture School (Entrepreneurial Training Program for Startups)
  Iowa Centers of Enterprise, University of Iowa, Iowa, USA — Fall, 2013