Qianhui Wan

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EDUCATION

Sun Yat-sen University, China Expected to graduate in July 2017

B.S. in applied mathematics, School of Mathematics
Overall GPA: 3.4/4.0

University of California, Berkeley 01/2016 - 05/2016

Exchange student, Department of Mathematics
Overall GPA: 3.9/4.0

University of Wisconsin-Madison 09/2016 - 05/2017

Visiting international student, Department of mathematics
Overall GPA: 4.0/4.0

RESEARCH & WORKING EXPERIENCES

Senior Honor Thesis (Supervisor: prof. Qin Li) 12/2016 - Present

Dept. of Mathematics, University of Wisconsin-Madison, USA

- I've been working under the supervision of prof Qin Li, who's an expert in numerical analysis and mathematical physics. I'm now working on a new numerical scheme that can be used in solving nonlinear transport equation with stability and accuracy.

Computation Lab Assistant (PI: prof. Amir Assadi) 09/2016 - Present

Dept. of Mathematics, University of Wisconsin-Madison, USA

- I've been working as a research assistant in professor Assadi's group since fall 2016. The work duties is similar to a math class teaching assistant, tailored on blended method with emphasis on modeling from lab data and computational problem solving.

Autism Data Based Machine Learning Project 09/2016 - Present

Dept. of Mathematics, University of Wisconsin-Madison, USA
Advisor: Prof. Amir Assadi

- We're collaborating with professor Brittany Travers from department of Psychology and got her data about movement videos of autism patients and ordinary people. We try to figure out the special behavior order of autism patients and finally tell whether a new coming person tested with basic movements are in the autism group.
- We're now doing SVM and PCA to preprocess the data and see which part of data points from human bodies carry the most movement information. Then we apply some machine learning algorithms to make the classification of people.

HP Protein Model Based Particle Swarm Optimization Project (in course) 09/2016 - 11/2016

Dept. of Mathematics, University of Wisconsin-Madison, USA
Instructor: Prof. Julie C Mitchell

- I applied a method of hybrid genetic-based PSO in finding the global minimum of energy function in Hydrophobic-Polar protein model, and see if it works efficiently. I tested with short HP sequences and found that the method performs well, and comparably stable since it introduces genetic processes like mutations and crossovers in PSO.

Multivariate Arabidopsis Project 09/2015 - Present

Dept. of Epidemiology and Biostatistics, Karolinska Institutet, Sweden
Advisor: Dr. Xia Shen

- We studied the data from paper of Atwell et al. in 2010, which did the single variant genome-wide association (GWA) studies with 107 phenotypes of *Arabidopsis thaliana* inbred lines, but we processed the data with multivariate methods, which is developed by my project advisor.
- We did the bivariate genomic analysis and found two locus on Chromosome 1 and 3 of huge impact on bacteria hypersensitive response and flowering time.
- I mainly dealt with the data analysis part using R, and the gene locating based on NCBI database and 1001 Genome Database.

Look Into ZIKA Data Project 06/2016 – Present

Dept. of Mathematics, University of California, Berkeley, USA
Advisor: Prof. David Aldous

- I raised the topic in order to find some epidemic trends based on the ZIKA virus data, further its spreading prediction, and possible associations with other diseases.
- I applied some epidemic models, linear regression, curve fitting methods in studying the data, now I'm trying stochastic methods with Markov chains and see if it helps in predicting work.

CEGA-Trace Project 01/2016 – 05/2016

Dept. of Social Welfare, Berkeley Institute of Data Science, University of California, Berkeley, USA
Advisor: Dr. Anthony Sun, Dr. Woojin Jung

- Text analysis of World Bank welfare reports and linkage analysis with real financial transfers to developing countries.
- My work was to find the exact country and time information in texts of 500 reports using the Python version of Stanford NER package in NLP, thus help find the associations between the receptors and investors.
- Results showed that there's strong correlation between research of World Bank and the real financial aids.

Face Recognition Project 01/2016 – 05/2016

- A course project of image processing, in which I wrote MATLAB scripts to do the PCA and KL transform of human face images in my database of around 100 faces, and used "Eigenfaces" to make the new face recognition.

PUBLICATIONS

Biao Wang, Zhuocheng Li, Weilin Xu, Xiao Feng, Qianhui Wan, Yanjun Zan,
Sitong Sheng, Xia Shen. (under review) "Bivariate genomic analysis identifies a hidden locus associated with bacteria hypersensitive response in *Arabidopsis thaliana*", Scientific Reports.

CONFERENCES

Hasti Mirkia, Mark S.C. Nelson, Qianhui Wan, Yilin Wang, Amir Assadi, "Modeling perception of geometry and motion in interior spaces", Conference of Psychology of Architecture, Austin, TX, Dec 2016.

SKILLS

- Good implementation skills in MATLAB, C/C++, R, and basic in Python.
- Knowledge of data structure and algorithms.
- Mandarin native speaker, proficient in English, basic in Cantonese and French.
- Excellent learning, teamwork and time management ability.

STANDARD TESTS

GRE:	Total 324, Verbal 154, Quantitative 170, Analytical Writing 3.5
TOEFL IBT:	Total 100, Speaking 23, Reading 28, Listening 24, Writing 25

SELECTED COURSES

Fourier Analysis, Wavelets and Signal Processing (MATH 118 in UC Berkeley), A

Topics in Partial Differential Equations (MATH 279 in UC Berkeley), A

Computational Methods in Math I (Math 714 in UW Madison), A

Computational Methods in Math II (Math 715 in UW Madison), in process

Seminar in probability and statistics (Math 154 in UC Berkeley), A-

Math Methods in Structural Biology (Math 606 in UW Madison), A

Differential Geometry (Sun Yat-sen University), 88/100

AWARDS & HONORS

- Best Software Prize, Gold Medal, International Genetically Engineered Machine Competition (iGEM), 2015
- SYSU Outstanding Student Prize, as a member of SYSU-Software team of iGEM, 2015
- Scholarship of Math School, Sun Yat-sen University, 2015
- Meritorious Prize, Mathematical Contest in Modeling (MCM), 2014

REFERENCES

- Prof. Amir Assadi, amir.assadi@icloud.com, Department of Mathematics, University of Wisconsin-Madison, USA
- Prof. David Aldous, aldousdj@berkeley.edu, Department of Mathematics and Statistics, XXX University, USA
- Prof. Daniel Tataru, tataru@math.berkeley.edu, Department of Mathematics, University of California, Berkeley, USA
- Prof. Julie C. Mitchell, jcmitchell@wisc.edu, Department of Biochemistry and Department of Mathematics, University of Wisconsin-Madison, USA
- Dr. Xia Shen, xia.shen@ed.ac.uk, Usher Institute of Population Health Sciences & Informatics, University of Edinburgh, UK. Department of Epidemiology and Biostatistics, Karolinska Institutet, Sweden