Yi (Grace) Wang

CONTACT INFORMATION

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RESEARCH INTERESTS

Computational Harmonic Analysis, Statistical Learning, Modeling High-Dimensional Data Clouds by Low-Dimensional Structures, Signal and Image Processing, Real Data Applications.

EDUCATION

University of Minnesota, Minneapolis, Minnesota USA

Ph.D., Mathematics, Aug. 2012

- Thesis Topic: "Robust Hybrid Linear Modeling and its Applications" advised by Gilad Lerman

M.S., Statistics, Aug. 2012
M.S., Mathematics, June 2010

Huazhong University of Science and Technology (HUST), Wuhan, Hubei China

B.A., Mathematics, June 2005

ACADEMIC EXPERIENCE

Syracuse University, Syracuse, New York USA
Assistant Professor **August, 2015 - present**

Duke University, Durham, North Carolina USA
Visiting Assistant Professor (Mentor: Ingrid Daubechies) **August, 2012 - July, 2015**

Statistical and Applied Mathematical Sciences Institute (SAMSI), Durham, North Carolina USA
Postdoctoral Researcher **August, 2012 - July, 2014**

University of Minnesota, Minneapolis, Minnesota USA
Teaching and Research Assistant **August, 2006 - August, 2012**

MCM Advisor **October, 2010**
Helped with the training session, evaluation of the final papers and advising in the Mathematical Contest in Modeling (MCM), Institute of Mathematics and Its Applications (IMA).

REU Mentor **June 14-July 16, 2010**
Co-presented the problem, led students into simulations and answered questions in the special program, Interdisciplinary Research Experience for Undergraduates (REU), IMA.

PUBLICATIONS

In preparation

1. Lei, J., Liu, K., Shen, L., and Wang, Y., *Ventricular Anatomical Measurements Improves the Prediction of Cardiac Resynchronization Therapy Response*, in preparation.
2. Abry, P., Daubechies, I., Jaffard S., Wang, Y. and Wendt, H., *A Review of Forgery Detection in Paintings with new Discoveries*, in preparation.
3. Wang, Y. and Zhang, L. *Robust Nonnegative Low-Rank Matrix Recovery*, in preparation.
4. Guo, W., Raskutti, G., Sun, J., Wang, Y. and Yang, D., *Compressive Support Detection based on Multiple Hypothesis Testing and Tube Method*, in preparation.

Journal Papers

5. O'Neal W.T., Wang, Y., Wu, H.-T., Zhang, ZM., Li, Y., Tereshchenko, LG., Estes, EH., Daubechies, I. and Soliman, EZ. *Electrocardiographic J-Wave and Cardiovascular Outcomes in the General Population (from the Atherosclerosis Risk in Communities Study)*, The American Journal of Cardiology, `http://dx.doi.org/10.1016/j.amjcard.2016.06.047`, 2016.
6. Wang, Y., Chen, G., and Maggioni M., *High Dimensional Data Modeling Techniques for Detection of Chemical Plumes and Anomalies in Hyperspectral Images and Movies*, IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing, DOI: 10.1109/JSTARS.2016.2539968, 2016.
7. Wang, Y., *Consistency and Convergence Rate for Nearest Subspace Classifier*, Information and Inference: A Journal of the IMA, DOI: 10.1093/imaiai/iaw006, 2016.
8. Daubechies, I., Wang, Y., and Wu, H., *ConceFT: Concentration of Frequency and Time via a multitapered synchrosqueezed transform*, Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences, 374(2065): 20150193, 2016.
9. Mahabal, A., Faraway, J., Zhang, L., Wang, Y., Wang, X. and Sun, J., *Modeling Light Curves for Improved Classification*, Statistical Analysis and Data Mining, DOI: 10.1002/sam.11305, 2016.
10. Wang, T., Chen, Y., Wang, Y., Wang, B., Wang, G., Li, X., Zheng, H. and Zhao, B., *The Power of Comments: Fostering Social Interactions in Microblog Networks*, Springer Frontiers of Computer Science, DOI: 10.1007/s11704-016-5198-y, 2015.
11. Wang, Y., Wu, H., Daubechies, I., Li, Y., Estes, H., and Soliman, E. *Automated J Wave Detection from Digital 12-lead Electrocardiogram*, Journal of Electrocardiology, Vol. 48, No. 1, pp. 21-28, 2015.
12. Wang, Y., Szlam, A. and Lerman, G., *Robust Locally Linear Analysis with Applications to Image Denoising and Blind Inpainting*, SIAM Journal on Imaging Sciences (SIIMS), Vol. 6, No. 1, pp. 526-562, 2013.
13. Zhang, T., Szlam, A., Wang, Y. and Lerman, G., *Hybrid Linear Modeling via Local Best Flats*, International Journal of Computer Vision, Volume 100, Issue 3, pp. 217-240, 2012.

Referred Conference Papers

14. Wang, Y. and Szlam, A., *K-Mappings and Regression Trees*, IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP), 2014.
15. Wang, Y. and Porikli, F., *Multiple Dictionary Learning for Blocking Artifacts Reduction*, IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), Paper: IVMSP-P4.8, March 2012.
16. Hunt, F. Y., Marbukh, V. and Wang, Y., *A Mathematical Model of Joint Congestion Control and Routing in Multisource Networks*, Proceedings of the IEEE International Conference on Control Applications, CCA 2011.
17. Zhang, T., Szlam, A., Wang, Y. and Lerman, G., *Randomized Hybrid Linear Modeling by Local Best-fit Flats*, IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2010.

PRESENTATIONS

Consistency and Convergence Rate for Nearest Subspace Classifier,
UP-STAT 2016 Conference, Buffalo, NY **April, 2016**

ConceFT: Concentration of Frequency and Time via a multitapered synchrosqueezed transform,

Applied Math Seminar, General Electric Global Research Center, NY **July, 2016**
SIAM Conference on Imaging Science, Albuquerque, NM **May, 2016**
Math Colloquium, Colgate University, NY **March, 2016**
Machine Learning Seminar, Binghamton University (SUNY), NY **March, 2016**

Data Analysis with Low-dimensional Structures,

Applied Math Seminar, University of Alabama at Tuscaloosa, AL **February, 2015**
Applied Math Seminar, Louisiana State University, LA **February, 2015**
Statistics Seminar, University of Wisconsin at Madison, WI **February, 2015**
Applied Math Seminar, Syracuse University, NY **February, 2015**
Applied Math Seminar, Michigan State University, MI **January, 2015**
Applied Math Seminar, College of Staten Island, NY **March, 2014**
Applied Math Seminar, University of Alabama at Birmingham, AL **September, 2014**
Digital Technology Center Seminar, University of Minnesota, MN **October, 2014**

Compressive Inference based on Multiple Hypothesis Testing and Tube Method,

SIAM Conference on Imaging Science, Hong Kong, China **May, 2014**

K-Mappings and Regression Trees,

Applied Math Seminar, Claremont McKenna College, Claremont, CA **Nov, 2013**
IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP), Florence, Italy **May, 2014**

Forgery Detection in Paintings,

Joint Statistical Meetings, Montreal, Canada **August, 2013**
SIAM Annual Meeting, San Diego, CA, USA **July, 2013**

Robust Locally Linear Analysis with Applications to Image Denoising and Blind Inpainting,

Shape Analysis Seminar, UNC, Chapel Hill, NC, USA **Nov, 2012**
SIAM Annual Meeting, Minneapolis, MN, USA **July, 2012**
SIAM Conference on Imaging Science, Philadelphia, PA, USA **May, 2012**

Professional Services

Reviewer for Artificial Intelligence and Statistics Conference, **2016**
Reviewer for SIAM Journal on Imaging Sciences (SIIMS), **2016**
Review editor for Frontiers in Applied Mathematics and Statistics, **2016**
Reviewer for Conference on Neural Information Processing Systems (NIPS), **2016**
Reviewer for Applied and Computational Harmonic Analysis, **2016**
Reviewer for IEEE Transactions on Signal Processing, **2014**
Reviewer for IEEE Transactions on Neural Networks and Learning Systems, **2014**
Panelist for National Science Foundation (NSF), **2013, 2014**
Reviewer for IEEE Signal Processing Letters, **2013**

Awards and Grants

(**Pending**) Joint NSF/NIH Initiative on Quantitative Approaches to Biomedical Big Data (QuBBD)
SIAM Early Career Travel Award, 2014
SIAM Travel Award, 2012
Graduate Fellowship, HUST, 2005

Excellent Undergraduate Student, HUST, 2005
Kwang-Hua Scholarship, HUST, 2001

Teaching Experience

Syracuse University, Syracuse, New York USA

Lecturer **August, 2015 - present**

- Math Methods for Data Science, MAT 500 **Fall 2016**
- Caculus III, MAT 397 **Fall 2015, Spring 2016**
- Numerical Methods with Programming, MAT 581 **Spring 2016, Spring 2017**

Duke University, Durham, North Carolina USA

Lecturer **August, 2013 - July, 2015**

- Multivariable Caculus, MATH 212 **Fall 2013**
- Multivariable Caculus, MATH 212 **Fall 2014**
- Ordinary Differential Equations (ODE) and Partial Differential Equations (PDE), MATH 353
  Spring 2015

University of Minnesota, Minneapolis, Minnesota USA

Teaching Assistant **September, 2006 - December, 2009**

Taught discussion classes, held office hours and graded exams and homework.

- Calculus I, MATH 1271 **Fall 2008, Fall 2009**
- Calculus II, MATH 1272 **Fall 2006, Spring 2007**
- Pre-calculus, MATH 1151, MATH 1155 **Fall 2007, Spring 2008**

Grade homework.

- Probability and Statistics, MATH 5651 **Spring 2009**

Internships

Mitsubishi Electric Research Laboratories, Cambridge, Massachusetts USA

Research Assistant **June - August, 2011**

Developed efficient sparse reconstruction methods for structured noise. Worked on blocking artifacts reduction and local variance noise removal.

Vision-Ease Lenses, Ramsey, Minnesota USA

Research Assistant **June - August, 2008**

Executed sustainability project, collected and analyzed data, and wrote and presented the final report.

Patent

Method for reducing blocking artifacts in images.
Patent number: 8942467. Inventors: Fatih Porikli and Yi Wang.