Ruohan ZHAN

☎ (86)1302-004-5083 ✉ ruohanzhan@gmail.com
Peking University, Beijing 100871, P.R.China

EDUCATION

Yuanpei College, Peking University (PKU), Beijing, China *09/2013-Present*
B.S. Candidate in Mathematics of Computation.

- Rank: 1/24; Overall GPA: 3.87/4.00 (121 credits); GRE Subject in Mathematics: 99%.
- *Graduate* Courses:
  Convex Optimization(97); Statistical Learning(94); Applied Partial Differential Equations(90);
  Mathematical Image Processing(91);

PUBLICATION

- **Ruohan Zhan**, Bin Dong. *CT Image Reconstruction by Spatial-Radon Domain Data-Driven Tight Frame Regularization* accepted by SIAM Journal on Imaging Sciences, April 2016.
- Baichuan Yuan, Sathya R. Chitturi, Geoffrey Iyer, Nuoyu Li, Xiaochuan Xu, **Ruohan Zhan**, Rafael Llerena, Jesse T. Yen, Andrea L. Bertozzi. *Machine Learning in Cardiac Ultrasound Videos* accepted by SPIE Medical Imaging 2017.

RESEARCH EXPERIENCE

Beijing International Center for Mathematical Research, PKU **Beijing, China**
Research Assistant to Prof. Bin Dong, *05/2015-01/2016*
Project Name: CT Image Reconstruction by Spatial-Radon Domain Data-Driven Tight Frame Regularization(First Author, accepted),

- Model and Algorithm: developed a CT image reconstruction model which combines the joint sparsity in CT image domain and projection image domain. Tight frames are adaptively learned to provide optimal sparse approximations.
- Computation: wrote a package for CT image restoration including wavelet transforms, tight frame learning; compared it with the previous methods using MATLAB.

California Research Training Program in Computational and Applied Mathematics, UCLA LA, USA
Supervised by Prof. Andrea L. Bertozzi, *07/2016-09/2016*
Teamed with: Sathya R. Chitturi, Nuoyu Li, Xiaochuan Xu; Mentored by Baichuan Yuan, Geoff Iyer.
Project Name: Machine Learning in Medical Imaging(accepted)

- Method: An automatic method is developed for cardiac diagnosis on ultrasound videos. Non-negative matrix factorization was used to extract end-members, followed by an automatic estimation of heart rate and ejection fraction.
- Contribution: implemented active contour model incorporated with shape prior and time consistency; applied ISOMAP and LLE to nonlinear dimension reduction using MATLAB.

Department of Mathematics, NUS **Singapore**
Research Assistant to Prof. Zuowei Shen and Prof. Hui Ji, *09/2016-present*
Project Name: De-reflection via Two Wavelet Systems

- proposed a two-wavelet-system approach to achieve both low-frequency part separation and high-frequency edge preservation; put up with a two-stage approximation algorithm based on variable splitting to solve the model.

Department of Mathematics, UCLA **LA, USA**
Research Assistant to Prof. Yuan Yao, discuss with Prof. Stanley Osher *06/2016-present*
Project Name: Split Bregman Iteration(SBI) and Linearized Split Bregman Iteration(L-SBI) Applied to Tuning Neural Network(NN)

- Model and Algorithm: SBI and L-SBI are explored to tune NN for multi-class classification problem.
- Computation: Implemented all algorithms using MATLAB.

School of Mathematics, PKU **Beijing, China**
Supervised by Prof. Pingwen Zhang, *05/2015-03/2016*
Teamed with: Xintian Han, Jiashuo Jiang, Molei Liu
Project Name: Statistical Machine Learning in Liquid Crystal Property Prediction
(Group Leader, Funded by the National Innovation Project, Minister of Education)

- Method: To use the boosting methodology, statistical and machine learning methods including SVM, SVR, Random forests, neural network and graphical models were applied to classification and regression problems in liquid crystal property prediction.
- Computation: Implemented the algorithms using Python, MATLAB, R.

SELECTED HONORS

- Innovation Award, PKU (1%) *10/2016*
- National Scholarship (2%) *10/2016*
- Lixin Tang Scholarship (3%) *10/2016*
- Finalist of the 32th Mathematical Contest in Modeling, COMAP *04/2016*
- WeTech Qualcomm Global Scholars award(18 female students in China) *12/2015*
- Lixin Tang Scholarship (3%) *10/2015*
- First Price in the 23th PKU Challenge Cup, with research on new charity based on social network *05/2015*
- Lixin Tang Scholarship (3%) *10/2014*

ACADEMICAL ACTIVITY

Translator, *Condition: The Geometry of Numerical Algorithms* *05/2016-present*
written by Peter Bürgisser and Felipe Cucker, Springer Science & Business Media (2013). together with Prof. Yuan Yao

Speaker, Level set Seminar in Department of Mathematics, UCLA *9.6/2016*
hosted by Prof. Stanley Osher

- Give academical report to audience on Split Bregman and Linearized Split Bregman applied to tuning neural network.

Mathematics Minister, Yuanpei Academic Societies of Students(YASS) *06/2015-06/2016*

- Serviced students' academic daily life with contribution to interdisciplinary communications including mathematics, physics, computer sciences, economics and etc. Held seminars, lectures and student math center.

Teaching Assistant, The Seminar for Grade One Science Students *09/2015-01/2016*

COMPUTATIONAL AND LANGUAGE SKILLS

- Proficient in MATLAB, LaTeX; Familiar with C, HTML;
- Operating systems: macOS, Linux and Windows;
- Fluent in English; TOEFL: 106; GRE: V:153, Q:170, AW: 3.5

EXTRACURRICULAR ACTIVITY

- Leadership: Counsellor of 2014 Summer Camp for Yuanpei Freshmen, PKU; Host of Closing Ceremony for Lee Shui Summer Program, HKU, PKU.
- Service: Volunteer of Yuanpei library; Volunteer of hospice care held by Young Volunteers Association in Department of Psychology, PKU; Language partner of Pitzerchina Program;
- Other hobbies: photography, hiking, running.