Ruohan ZHAN

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Peking University, Beijing 100871, P.R.China

EDUCATION

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

- Rank: 1/45; Overall GPA: 3.87/4.00 (125 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*, SIAM Journal on Imaging Sciences, 9(3), 1063-1083, 2016.

- Baichuan Yuan, Sathya R. Chitturi, Geoffrey Iyer, Nuoyu Li, Xiaochuan Xu, **Ruohan Zhan**, Rafael Llerena, Jesse T. Yen, Andrea L. Bertozzi. *Machine Learning for Cardiac Ultrasound Time Series Data*, SPIE Medical Imaging 2017.

RESEARCH EXPERIENCE

Beijing International Center for Mathematical Research, PKU   **Beijing, China**
Research Assistant to Prof. Bin Dong,   *09/2015-01/2016*
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 reconstructed CT image domain and interpolated projection image domain. Tight frames are adaptively learned to provide optimal sparse approximations.

- Computation: a MATLAB package for CT image restoration including wavelet transformation, tight frame learning.

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 for Cardiac Ultrasound Time Series Data(accepted)

- Method: an automatic method was developed for cardiac diagnosis on ultrasound videos. Non-negative matrix factorization(NMF) was used to extract end-members, followed by calculations of heart rate and ejection fraction.

- Contribution: used level set method to solve modified active contour model incorporated with shape prior and time consistency; compared NMF with ISOMAP and LLE using MATLAB.

Department of Mathematics, National University of Singapore   **Singapore**
Research Assistant to Prof. Zuowei Shen and Prof. Steven Kou,   *10/2016-present*
Project Name: Data-driven Estimation of Option Price

- Method: used basis functions to approximate a two-dimensional function and then computationally-practically extrapolated it to three-dimensional case to satisfy online data processing.

Department of Mathematics, UCLA   **LA, USA**
Research Assistant to Prof. Yuan Yao, discuss with Prof. Stanley Osher,   *06/2016-09/2016*
Project Name: Split Bregman Iteration(SBI) and Linearized Split Bregman Iteration(L-SBI) Applied to Tuning Neural Network

- Model and Algorithm: SBI and L-SBI are explored to tune neural network for multi-class classification problem.

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

TEACHING EXPERIENCE

- Teaching Assistant, The Seminar for Grade One Science Students; *09/2015-01/2016*
- Counsellor for Freshman in Yuanpei College. *09/2014-12/2014*

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 *06/2015-06/2016*

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

Group Contact, Research on Waste Management in Hong Kong and Qingdao *07/2014-08/2014*

COMPUTATION 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

- 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.