# Quanjun Lang

Department of Mathematics
Johns Hopkins University, 3400 N. Charles St. Baltimore, MD, 21210

E-mail: quanjun.lang@jhu.edu Phone: +1 443-825-1130

## EDUCATION

**2017-2023** **Ph.D. in Mathematics (Expected)**
Johns Hopkins University (JHU)
Advisors: Drs. Yannick Sire and Fei Lu

**2013-2017** **B.S. in Mathematics and Applied Mathematics**
Sun Yat-Sen University (SYSU)
School of Mathematics, National top-notch training plan of fundamental subjects
Outstanding Graduates (top 1%), GPA 4.0

## INDUSTRIAL AND LAB EXPERIENCE

**2021.6-2021.8**
**2022.1-2022.6** **Voloridge Investment Management, Research Intern**
- Build models to detect the streakiness of time series data.
- Construct nonparametric regression model to estimate the volatility.

**2018.6-2018.8** **Beijing Genomics Institute (BGI), Research Intern**
- Analyzed medical data, including brain MRI, body fat and fitness evaluation.
- Proposed a statistical model of body score.

**2015.3-2015.7** **Natural Language Processing Lab, School of Mathematics, SYSU**
- Implemented Chinese word separation and Word2Vec by statistical method and deep learning.
- Developed medical article suggestion system using cosine similarity and deep learning.

**2016.6-2016.8** **Combinatorics Center, Nankai University**, (Mentor: Dr. Yongchuan Chen)
- Studied graph theory and combinatorics.
- Participated in image restoration program, using matrix LU decomposition.

## PUBLICATIONS

1 **Learning interaction kernels in mean-field equations of 1st-order systems of interacting particles.**
**Quanjun Lang**, Fei Lu, (SIAM Journal on Scientific Computing)
- Proposed a new error functional based on likelihood ratio for the interaction kernel of mean-field equations.
- Introduced a nonparametric least square inference algorithm with optimal regularization.
- Provided performance guarantee with respect to the discrete space and time mesh size.

2 **Regularity for some Levy processes with pure jumps and sub-Gaussian estimates.**
Fabrice Baudoin, **Quanjun Lang**, Yannick Sire, (preprint, arxiv:2010.01036)
- Generalized the Caffarelli-Silvertre Extension technique to Dirichlet spaces.
- Provided Harnack principles for the extended Dirichlet space.

3 **Identifiability of interaction kernels in aggression-advection equations of interacting particles.**
**Quanjun Lang**, Fei Lu, (preprint, arxiv:2106.05565)
- Discussed the identifiability of learning interaction kernels in different function spaces, like RKHS and L2 space.
- Provided a sufficient condition to guarantee the identifiability.
- Illustrated our proposal by numerical tests.

4 **Data adaptive RKHS Tikhonov regularization for learning kernels in operators**
Fei Lu, **Quanjun Lang**, Qingci An, (preprint, arXiv:2203.03791)
- We present a Data Adaptive RKHS TIkhonov Regularization (DARTR) method for the linear inverse problem of nonparametric learning of function parameters in operators.
- Numerical results show that DARTR leads to an accurate estimator robust to numerical error and noise in data.

## SKILLS

- Python (Pytorch, TensorFlow, Numpy), MATLAB, R
- Machine Learning, Deep Learning, NLP, Machine Translation, Probability, Statistics