

Haotian Li

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EDUCATION

- **University of California, Davis** Davis, CA
Ph.D. Candidate in Applied Mathematics; GPA: 3.94/4; Advisor: Naoki Saito Sep. 2016 – Jun. 2021 (expected)
- **Sichuan University** Sichuan, China
Bachelor of Science in Mathematics; Major GPA: 95/100; Advisor: Xiaoping Xie Sep. 2011 – Jun. 2015
- **Hong Kong University of Science and Technology** Hong Kong
Exchange program; GPA: 4.3/4.3; Dean's list in HKUST Jan. 2014 – Jun. 2014

WORKING & RESEARCH EXPERIENCE

- **Adobe Inc.** San Jose, CA
Research Intern Apr. 2019 - Sep. 2019
 - Solve imaging problems with other researchers by mathematical methods: linear and multilinear algebra, computer vision, lightfield, computed tomography, applied computational harmonic analysis, e.t.c.
 - Analyze data of different modalities such as images, video, lightfields.
 - Work independently for algorithm development and prototyping, e.g., applying computed tomography on lightfields and using POCS algorithm for inpainting and foreground enhancement.
 - Write and submit two papers to arXiv.
- **University of California, Davis** Davis, CA
Graduate Student Researcher Jan. 2017 - Present
 - Study and construct different metrics of graph Laplacian eigenvectors and design natural graph wavelet packets based on the eigenvector “behaviors” on various graphs.
 - Develop Natural Graph Wavelets Julia package on GitLab and compare numerical results obtained by other graph signal analyzing tools, e.g., GHWT, eGHWT, SGWT.

PROJECTS

- **Metrics of Graph Laplacian Eigenvectors** Sep. 2017 - Present
Design and study the metrics of graph Laplacian eigenvectors, which measure the behavioral difference between the eigenvectors and provides meaningful ordering of eigenvectors. This work leads to design a multiscale basis on graphs.
- **Natural Graph Wavelet Packets** Sep. 2018 - Present
Based on the metrics of graph Laplacian eigenvectors develop natural graph wavelet packets by Julia, which has great potential applications in graph signal processing, e.g., efficiently approximating graph signals and solving differential equations on graphs.
- **Earth Mover Distance and Ramified Optimal Transport** Sep. 2017 - Aug. 2018
Study earth mover distance (EMD) and ramified optimal transport method. Perform numerical simulations by Julia. Tell the difference between the optimal solutions of the two methods based on theories and numerical results.
- **Machine Learning Classification Problem** Jun. 2018
Solve the Stail/C-CORE Iceber Classifier problem in Kaggle by various ML methods (in Python): SVM; Low rank approximation + SVM ; Adaboost; Stochastic gradient boosting; Random Forest; Decision Tree; Nearest neighbors classification; Neural network; Convolutional neural network (Keras, LeNet-5). CNN has the best 83% accuracy.

PAPERS

- “Lightfield coordinates adapted to Asgeirsson’s theorem” arXiv preprint arXiv:1909.07923 (2019).
- “Metrics of graph Laplacian eigenvectors”, in Wavelets and Sparsity XVIII Proc. SPIE 11138, 2019.
- “John transform and ultrahyperbolic equation for lightfields” arXiv preprint arXiv:1907.01186 (2019).
- “Natural graph wavelet packets” (in preparation)

TECHNICAL STRENGTH

- **Languages and Tools:** Python, Julia, Matlab, C++, R, SQL, Git, L^AT_EX, TensorFlow
- **Others:** Machine Learning (Deep learning), Optimization, (Graph) Signal Processing, Scientific Computing