Yanyao Shen | Curriculum Vitae

3500 Greystone Dr., Apt 247, 78731 – Austin – Texas
+1 512 406 1170 • +86 1343 926 7722 • shenyanyao@utexas.edu
shenyanyao.github.io

Education

- **University of Texas at Austin** — **Austin, Texas, U.S.**
  Ph.D. in Electrical and Computer Engineering, ***GPA: 4.00/4.00*** — *2015.08 – now*
- **Tsinghua University** — **Beijing, China**
  Bachelor of Engineering in Electronic Engineering, ***GPA: 92/100*** — *2011.09 – 2015.07*
- **Tsinghua University** — **Beijing, China**
  Second Bachelor's Degree in School of Economics and Management — *2012.09 – 2015.07*

Projects

- **CapitalOne Fraud Detection Competition:** *Team Leader, 2016.02 – 2016.04*

  Detecting fraud behavior is the key of analyzing credit card behavior and ensures customer satisfaction. In order to tackle this problem, we design a fraud detection model for large dataset with feature engineering and make evaluations. More specifically, we design three characteristic models based on fraud behavior and use algorithms including gradient boosted trees, logistic regression to generate predictions. We get **2nd place** in overall performance.

- **Image Feature Points Matching:** *Research Assistant, 2015.10 – 2016.09*

  Inconsistency widely exist in computer vision domain which makes machine less intelligent. The key problem lies in the mechanism of dealing with noise. In this project, we assume that we are only able to exploit noisy feature mapping, and the goal is to recover the underlying feature matching ground truth. We propose a normalized spectral method which is both computation efficient and achieves robust performance. Moreover, our novel contribution is analyzing the random permutation noise and prove the convergence and optimality of the algorithm. Our paper was accepted by **NIPS**, a top tier conference in machine learning.

- **Deep Learning on Yearbook Facial Data:** *Team Leader (Course Project), 2016.08 – 2016.10*

  Whether using regression or classification is a key issue in wide range of applications. We try to experiment the performance using both methods on a challenging computer vision task: predicting the year a photo was taken using graduation grayscale photo. We use finetune a 19 layer VGG networks with modification on the last fully connected layer using Tensorflow. Our model provides a 4.2 years prediction error on average.

- **A Projector Interactive System Based on Structured Light:** *Team Leader, 2012.09 – 2013.05*

  Gesture interaction simplifies the way we communicate, and simplifying the procedure machines decoding the gesture information is important. Using only RGB images without depth information, an online gesture capturing algorithm was designed and implemented in a projector interactive system using C++ (OpenCV), where efficiency of the algorithm is due to the careful design of detecting method based on structured light. We gave demo presentation and won a special prize in Beijing division.

Publications

- **Yanyao Shen**, Qixing Huang, Srebro Nathan, Sujay Sanghavi. "Normalized Spectral Map Synchronization". 13th Neural Information Processing Systems, accepted.
- Lei Xu, Chunxiao Jiang, **Yanyao Shen**, Tony QS Quek, Zhu Han, and Yong Ren. "Energy Efficient D2D Communications: a Perspective of Mechanism Design." IEEE Transactions on Wireless Communication, accepted.
- **Yanyao Shen**, Chunxiao Jiang, Tony QS Quek, and Yong Ren. "Device-to-Device-Assisted Communications in Cellular Networks: An Energy Efficient Approach in Downlink Video Sharing Scenario." IEEE Transactions on Wireless Communications 15, no. 2 (2016): 1575-1587.
- **Yanyao Shen**, Chunxiao Jiang, Tony QS Quek, and Yong Ren. "Location-aware device communication design: exploration and exploitation on energy." IEEE Wireless Communications 23, no. 2 (2016): 46-52.
- **Yanyao Shen**, Chunxiao Jiang, Tony QS Quek, Haijun Zhang, and Yong Ren. "Pricing equilibrium for data redistribution market in wireless networks with matching methodology." In 2015 IEEE International Conference on Communications (ICC), pp. 3051-3056. IEEE, 2015.
- **Yanyao Shen**, Chunxiao Jiang, Tony QS Quek, Haijun Zhang, and Yong Ren. "Device-to-device cluster assisted downlink video sharing—A base station energy saving approach." In Signal and Information Processing (GlobalSIP), 2014 IEEE Global Conference on, pp. 108-112. IEEE, 2014.

Honors and Awards

- CapitalOne Modelling Competition, Final round 2nd place. 2016.04
- Outstanding Graduates, Tsinghua University. 2015.06
- Outstanding Graduation Thesis in EE Department, Tsinghua University. 2015.06
- National Scholarship, Tsinghua University. 2013.10
- Special Prize (Highest) in the 13th "Challenge Cup" National Contest of College Students' Scientific and Technological Work, Beijing Division (Less than 1‰). 2013.09
- National Scholarship, Tsinghua University. 2012.10

Core Courses

- **Undergraduate level:** Signals and Systems (98/100, 1st/20), Calculus (100/100, 1st/130), Data Structure and Algorithms (93/100, 2nd/100), Linear Algebra (98/100), Computer Networks, Programming Language (C++, Matlab)
- **Graduate level:** Probability and Stochastic Processes (raw score 99.02%), Large-Scale Machine Learning, Algorithms: Techniques & Theory, Convex Optimization, Deep Learning, Sublinear Algorithm, Estimation Theory, Nonlinear Function Analysis, Digital Signal Processing

Skills

- **Programming Languages:**
  - Proficient in: C++, Python, Matlab, TeX, Bash.
  - Familiar with: Java, R, Stata, Javascript, SQL

Interests and Extra-Curricular Activities

- Music: Violinist in student symphony orchestra, won gold award in the 35th International Youth Music Festival in Vienna, Austria.
- Leadership: The team captain of a volunteer teaching group in Hainan Province, China for two weeks.