Fengchao Xiong

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Education

- **Griffith University**, Nathan, Queensland. (2017.11-2018.11)
  Visiting scholar in School of Information and Communication Technology.
  Supervisor: Dr. Jun Zhou.
- **Zhejiang University**, Hangzhou, Zhejiang. (2014.9-)
  Ph.D. candidate in College of Computer Science
  Supervisor: Prof. Yuntao Qian.
- **Shandong University**, Jinan, Shandong. (2010.9-2014.7)
  B.E in School of Software Engineering, July 2014.
  Thesis title: *Research on Fingerprint Image Segmentation Algorithm Based on Unsupervised Learning.*
  Supervisor: Prof. Gongping Yang.
  GPA: 88.8/100(Rank 22/259).
- **Wuhan University**, Wuhan, Hubei.(2011.9-2012.7)
  Exchange student in International School of Software.

Honors

- Excellent Exchange Student Scholarship (2012.9)
- Excellent Student Awards (2012.9)
- National Aspiration Scholarship (2011.9)
- Excellent Student Awards (2011.9)
- Excellent Graduate Student (2017.9)

Research interests

- Machine Learning
- Pattern Recognition
- Hyperspectral Imaging
- Computer Vision

Research projects

- Hyperspectral Unmixing (2014.9-).

  I utilized matrix-vector nonnegative tensor factorization, a special case of block term decomposition(BTD), to tackle hyperspectral unmixing in this project. This method decomposes a hyperspectral data cube into R component tensors represented by the outer-product of a matrix and a vector which denote abundance map and endmember respectively. We analysis the algorithm from theoretical perspective and experimental perspective. This work is published on IEEE Transactions on Geoscience and Remote Sensing (TGRS, JCR 2).

  However, HSI is high likely to be contained by various noise, which makes tensor factorization fails to be unique. To overcome this, in subsequent research, various prior information is imbedded into tensor factorization, resulting in superpixel based matrix-vector nonnegative tensor factorization (S-MV-NTF) and total variation regularized nonnegative tensor

factorization (MV-NTF-TV). In term of S-MV-NTF, taking advantage of superpixel in representing local spatial information, two specific regulations are added to factor matrices to enforce the pixels in the same superpixel to behave similarity. This will be submitted to IEEE International Geoscience Remote Sensing Symposium (IGARSS 2018). On account of MV-NTF-TV, the total variation is added to the abundance map directly to make the abundance map piecewise smooth, which will be submitted to IEEE Transactions on Geoscience and Remote Sensing (TGRS, JCR 2).

- ◇ Radar Working State Recognition (2015.7- 2017.2).

  I act as a team leader in this project, in cooperation with Southwest China Research Institute of Electronic Equipment. The aim of this project is utilizing machine learning algorithm to identify radar signal. Due to confidential agreement,I cannot describe the details of this project, but this work is interesting actually.

PUBLICATION
- ◇ Yuntao Qian, **Fengchao Xiong**, Shan Zeng, Jun Zhou, and Yuanyan Tang. "Matrix-Vector Nonnegative Tensor Factorization for Blind Unmixing of Hyperspectral Imagery". IEEE Transactions on Geoscience and Remote Sensing, 2017, 55(3): 1776-1792
- ◇ **Fengchao Xiong**, Yuntao Qian. "Superpixel-Based Nonnegative Tensor Factorization for Hyperspectral Unmixing", IGARSS 2018 (To be submitted)
- ◇ **Fengchao Xiong**, Yuntao Qian, Jun Zhou. "Hyperspectral Unmixing via Total Variation Regularized Nonnegative Tensor Factorization" ,IEEE Transactions on Geoscience and Remote Sensing (To be submitted)

PROGRAMMING
- ◇ Proficient: Java, Matlab
- ◇ Familiar: C, C++, Python, Linux

LANGUAGE
- ◇ Chinese: Native
- ◇ English: IELTS(6.5)