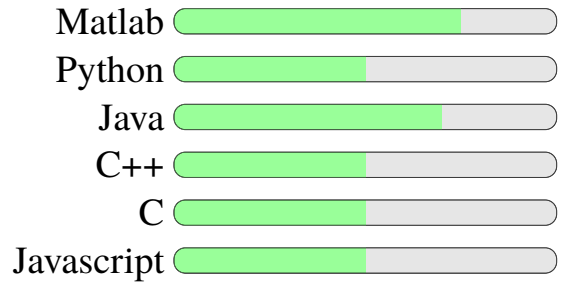




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🎓 EDUCATION

Griffith University, Nathan, Queensland. 2017.11-2018.11

Visiting Scholar in School of Information and Communication Technology, supported by China Scholarship Council (CSC).

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

Thesis title: Research on Fingerprint Image Segmentation Algorithm Based on Un-supervised 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.

📄 RESEARCH

- Object tracking
- Low-rank and sparse matrix/tensor representation
- Machine learning
- Deep learning

👤 EXPERIENCE

Object Tracking 2017.12-

Currently, I am doing research on object tracking in hyperspectral video. In this project, We mainly focus on the situations where the background and the foreground, i.e., the target and the surrounding environment, share similar colour and textures. These situations make traditional methods often fail to track. Thanks to numerous narrow bands in hyperspectral imagery (HSI), HSIs are more capable of material identification and provide an attractive way to solve the aforementioned problem. Therefore, we propose a material based object tracking framework in this project. Specifically, we build a spectral-spatial histogram of oriented gradients (SSHOG)

descriptor to describe the spectral-spatial textures in an HSI. Besides SSHOG, we also consider the distribution of underlying pure material (abundance map) discovered by unmixing as feature for tracking. Finally, we build a tracking system under the framework of correlation filter whose features are SSHOG and abundances.

Cancer Cell Classification

2018.7-

I cooperate with the researchers from University of Queensland and Griffith university on the cancer cell identification. In this project, we use hyperspectral imagery to distinguish the live cells from dead ones rather than cellular staining by using their spectral reflectance. Our ultimate aim is to use deep detection networks, for example, YOLO and SSD, to detect and classify the cells at the same time. Therefore, we are currently collecting more hyperspectral data to train such a hyperspectral-specified network.

Hyperspectral Denoising

2017.12-2018.5

This project aims to utilize tensor factorization to recover a corrupted HSI. Motivated by the merit of sparse representation and low-rank representation in HSI denoising, we proposed a sparse low-rank nonnegative tensor factorization method to remove noise in an HSI, where the low-rankness in both spatial and spectral domain is considered. This work has been accepted to IEEE International Conference on Image Processing (ICIP 2018).

Hyperspectral Unmixing

2014.9-2017.12

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 analyze 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 highly likely to be contaminated by various noise, which makes tensor factorization fail 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 terms 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 has been accepted by IEEE International Geoscience & Remote Sensing Symposium (IGARSS 2018) with oral presentation. On account of MV-NTF-TV, the total variation is added to the abundance map directly to make the abundance map piecewise smooth, which has been accepted by 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

1. 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. (JCR 2, CCF B)
2. **Fengchao Xiong**, Jingzhou Chen, Yuntao Qian, Jun Zhou. "Superpixel-Based Nonnegative Tensor Factorization for Hyperspectral Unmixing", *IEEE International Geoscience and Remote Sensing Symposium, IGARSS'18*, 2018.(Oral)
3. **Fengchao Xiong**, Yuntao Qian, Jun Zhou. "Hyperspectral Unmixing via Total Variation Regularized Nonnegative Tensor Factorization", *IEEE Transactions on Geoscience and Remote Sensing* (JCR 2, CCF B, In Press)
4. **Fengchao Xiong**, Yuntao Qian, Jun Zhou. "Hyperspectral Imagery Denoising via Reweighed Sparse Low-Rank Nonnegative Tensor Factorization", *IEEE International Conference on Image Processing, ICIP'18*, 2018 (CCF-C)
5. Kun Qian, Jun Zhou, Huixin Zhou, **Fengchao Xiong**. "Object Tracking in Hyperspectral Videos with Convolutional Features and Kernelized Correlation Filter", *International Conference on Smart Multimedia, ICSM 2018*
6. **Fengchao Xiong**, Yuntao Qian, Jun Zhou. "Hyperspectral restoration via L0 Gradient Regularized Low-Rank Sparse Tensor factorization", *IEEE Transactions on Geoscience and Remote Sensing*, 2018 (JCR 2, Under Review)

➤ PROFESSIONAL ACTIVITIES

Reviewer:

1. IEEE Transactions on Multimedia(TMM)
2. IEEE Transactions on Image Processing(TIP)
3. Multimedia Tools and Applications (MTA)

Volunteer: The 11th IAPR International Conference on Biometrics (ICB 2018)

2018.2

⚙️ SKILLS

- Programming Languages: Java == Matlab > Python > C
- Platform: Linux
- Development: Web, J2EE

♡ HONORS AND AWARDS

Excellent Graduate Student	2017.9
Excellent Exchange Student Scholarship	2012.9
Excellent Student Awards	2012.9
National Aspiration Scholarship	2011.9
Excellent Student Awards	2011.9

📌 MISCELLANEOUS

- GitHub: [GitHub: https://github.com/bearshng](https://github.com/bearshng)
- Blog: <http://www.xiongfuli.com>
- Languages: English - Fluent (IELTS, 6.5), Mandarin - Native speaker