

# Feiyun Zhu (Cited: 85)

Research Fellow at Department of CSE  
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🌐: <https://fly2rain.github.io/>

## Research Interests

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- (Deep) Reinforcement Learning and its applications on the mobile health (mHealth) intervention and smart games, such as Atari, Alphago, Heads-up No-Limit Hold'em Poker etc.
- Machine Learning, Pattern Recognition, Matrix/Tensor Methods and Manifold Learning, with a focus on two tasks: (1) nonnegative matrix factorization for spectral unmixing, (2) fast and robust (i.e. noise-tolerance) subset selection to summarize and visualize big data.

## Education

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- 2010-2015 **Institute of Automation, Chinese Academy of Sciences (CASIA), Beijing, China**  
**Ph.D.** in National Laboratory of Pattern Recognition (NLPR), *June 2015*  
Advisor: Prof. [Chunhong Pan](#), [Shiming Xiang](#) and Ying Wang.  
Thesis: "Unsupervised Hyperspectral Unmixing Methods".
- 2006-2010 **Beihang University (BUAA), Beijing, China**  
**B.S.** in Image Processing Center, School of Astronautics, *June 2010*  
Advisor: Prof. [Zhenwei Shi](#).  
Thesis: "Non-negative Tensor Factorization (NTF) for Spectral Unmixing".

## Working Experience

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- 2016-Present **Research Fellow, Department of CSE, University of Texas at Arlington, TX.**  
Advisor: Prof. [Junzhou Huang](#).
- Deep Reinforcement Learning for the hot games, e.g., Atari, Alphago, Poker.
  - Survival Analysis from Small Sample Medical Datasets.
  - Learning Fine-grained Information from Weak Labels in Survival Analysis.
  - *1 paper accepted by CVPR'17, 1 paper submitted to SIGKDD'17, 1 paper submitted to IJCAI'17 and 2 papers submitted to MICCAI'17.*
- 2015-2016 **Research Fellow, Department of Statistics, University of Michigan, MI.**  
Advisor: Prof. [Susan A. Murphy](#) and [Ambuj Tewari](#).
- Actor-critic reinforcement learning (RL) for mobile health intervention. To deal with various problems in the mHealth, we proposed several novel methods from the following three perspective:
    - proposed a robust actor-critic bandit method to deal with the various kinds of outliers in the dynamic system.

- proposed an effective warm start method for online RL to overcome the limited data collected from each user.
- proposed a cohesion-driven method to explore how to make use of the network cohesion among users to improve the performances.
- *1 paper submitted to SIGKDD'17, 1 paper submitted to ICML'17, 1 paper submitted to IJCAI'17, 2 papers submitted to MICCAI'17, 1 paper submitted to RLDM'17.*

## Awards and Honors

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- 2014: National Ph.D. Fellowship. (12/378, ranked 1st)
- 2012: National Master Fellowship. (7/256)
- 2013: Third Place, Baidu ICome image detection (Acc.: 96.8%).
- 2011-2014: Two times Excellent Student in CASIA.
- 2010-2011: Excellent Student Leader & Excellent Student in CASIA. (2/110)
- 2009: Third Prize in Fengru Cup Science & Technology Creative Contest, BUAA, CHINA.
- 2008: National Motivational Scholarships, BUAA, CHINA. (1/24)

## Publications

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### Peer-reviewed Journal Papers

1. [TGRSL'16] Guangliang Cheng, **Feiyun Zhu**, Shiming Xiang and Chunhong Pan. "Road Centerline Extraction via Semisupervised Segmentation and Multidirection Nonmaximum Suppression". IEEE Transactions on Geoscience and Remote Sensing Letters, vol. 9, no. 2, pp. 595-608, 2016.
2. [NeuroCp'16] Guangliang Cheng, **Feiyun Zhu**, Shiming Xiang, Ying Wang and Chunhong Pan. "Accurate urban road centerline extraction from VHR imagery via multiscale segmentation and tensor voting". Elsevier Neurocomputing, vol. 205, pp. 407-420, 2016.
3. [IJRS'16] Haichang Li, Ying Wang, Shiming Xiang, Jiangyong Duan, **Feiyun Zhu**, Chunhong Pan. "A label propagation method using spatial-spectral consistency for hyperspectral image classification". International Journal of Remote Sensing, vol. 37, no. 1, pp. 191-211, 2016.
4. [TIP'15] Ying Wang, Chunhong Pan, Shiming Xiang and **Feiyun Zhu**. "Robust Hyperspectral Unmixing with Correntropy based Metric". IEEE Transactions on Image Processing (IEEE TIP, IF=3.63), vol. 24, no. 11, pp. 4027-4040, 2015.
5. [JSTSP'15] Guangliang Cheng, **Feiyun Zhu**, Shiming Xiang, Ying Wang, Chunhong Pan. "Semisupervised Hyperspectral Image Classification via Discriminant Analysis and Robust Regression". IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing, 2015.
6. [TIP'14] **Feiyun Zhu**, Ying Wang, Bin Fan, Shiming Xiang and Gaofeng Meng, Chunhong Pan. "Spectral Unmixing via Data-guided Sparsity". IEEE Transactions on Image Processing, vol. 23, no. 12, pp. 5412-5427, 2014.

7. [ISPRS'14] **Feiyun Zhu**, Ying Wang, Shiming Xiang, Bin Fan and Chunhong Pan. "Structured Sparse NMF for Hyperspectral Unmixing". ISPRS Journal of Photogrammetry and Remote Sensing, vol. 88, no. 1, pp. 101-118, 2014.

## Preprint

1. [ArXiv'17] **Feiyun Zhu**, Peng Liao, Xinliang Zhu, Jiawen Yao and Junzhou Huang. "Cohesion-based Online Actor-Critic Reinforcement Learning for mHealth Intervention". arXiv:1703.10039 (under review).
2. [ArXiv'14] **Feiyun Zhu**, Ying Wang, Bin Fan, Gaofeng Meng and Chunhong Pan. "Effective Spectral Unmixing via Robust Representation and Learning-based Sparsity". arXiv:1409.0685 (under review).

## Peer-reviewed Conference Papers

1. [CVPR'17] Xinliang Zhu, Jiawen Yao, **Feiyun Zhu** and Junzhou Huang. WSISA: Making Survival Prediction from Whole Slide Pathology Images, CVPR 2017.
2. [ICASSP'16] Xiaoping Hu, Ying Wang, **Feiyun Zhu** and Chunhong Pan. "Learning-based fully 3D face reconstruction from a single image". IEEE Conference on Acoustics, Speech and Signal Processing (ICASSP), pp. 1651-1655, 2016.
3. [AAAI'15] **Feiyun Zhu**, Bin Fan, Xinliang Zhu, Ying Wang, Shiming Xiang and Chunhong Pan. "10,000+ Times Accelerated Robust Subset Selection (ARSS)". Proc. Association for the Advancement of Artificial Intelligence (AAAI), 2015. (AR: 531/1991~26.67%).
4. [ICIP'15] Guangliang Cheng, Ying Wang, **Feiyun Zhu** and Chunhong Pan. "Road extraction via adaptive graph cuts with multiple features". IEEE Conference on Image Processing (ICIP), pp. 3962-3966, 2015.
5. [ICIP'14] Guangliang Cheng, Ying Wang, Yongchao Gong, **Feiyun Zhu** and Chunhong Pan. "Urban road extraction via graph cuts based probability propagation". IEEE Conference on Image Processing (ICIP), pp. 5072-5076, 2014.

## Skills

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Computer: Python, Matlab (proficient), C/C++, Joint Programming (proficient)  
Linux, Qt (proficient), OpenCV, Latex/Lyx (proficient)

Language: Chinese (native), English

## Professional Service

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1. Reviewer of IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing.
2. Reviewer of Neurocomputing.
3. Reviewer of ISPRS Journal of Photogrammetry and Remote Sensing.
4. Student Volunteer for the 31st International Conference on Machine Learning (ICML), 2014.