

# Wei Xiong

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“Stay Simple, Stay Foolish”

## Biography

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- My research focuses on computer vision, deep learning and unsupervised feature learning. During my study at Wuhan University, I have been focusing on scene understanding with deep networks. Recently, I have been focusing on using generative adversarial networks for video generation.

## Educations

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### University of Rochester

Sep. 2017 - June.2022 (expected)

- Ph.D. in Computer Science
- Advisor: Prof. Jiebo Luo
- Topics: Video Generation

### Wuhan University

Sep. 2014 - June.2017

- M.S. in Computer Science and Technology
- Advisors: Prof. Bo Du, Prof. Lefei Zhang
- Topics: Deep Learning for Scene Understanding

### Wuhan University

Sep. 2010 - June.2014

- B.E. in Computer Science

## Publications

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- Wei Xiong, Lefei Zhang, Bo Du and Dacheng Tao. **Combining Local and Global: Rich and Robust Feature Pooling for Visual Recognition**. Pattern Recognition, vol. 62, pp. 225–235, 2017.
- Fengling Mao, Wei Xiong, Bo Du and Lefei Zhang. **Stochastic Decorrelation Constraint Regularized Auto-Encoder for Visual Recognition**. International Conference on Multimedia Modeling (MMM), 2017.
- Wei Xiong, Bo Du, Lefei Zhang and Dacheng Tao. **Regularizing Deep Convolutional Neural Networks with a Structured Decorrelation Constraint**. International Conference on Data Mining (ICDM), 2016. (regular paper.)
- Wei Xiong, Bo Du, Lefei Zhang, Liangpei Zhang and Dacheng Tao. **Denosing Auto-Encoders toward Robust Unsupervised Feature Representation**. International Joint Conference on Neural Networks (IJCNN), pp. 4721-4728, 2016. (Oral paper)
- Bo Du, Wei Xiong, Jia Wu, Lefei Zhang, Liangpei Zhang and Dacheng Tao. **Stacked Convolutional Denoising Autoencoders for Feature Representation**. IEEE Transactions on Cybernetics, no.99, pp.1-11, 2016.
- Wei Xiong, Bo Du, Lefei Zhang, Dacheng Tao, etc. **R<sup>2</sup>FP: Rich and Robust Feature Pooling for Mining Visual Data**. IEEE International Conference on Data Mining (ICDM), pp. 469-478, 2015. (Regular paper)

## Projects

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### Structured decorrelation constraint on convolutional networks

Oct. 2015 - Apr. 2016

- Problem: the hidden layers of current CNNs tend to learn redundant features due to the co-adaptions between the neurons.
- Proposed a novel regularizer to reduce the co-adaptions explicitly and leverage the coherent structures between the neurons, enforcing the network to learn structured and decorrelated representations.
- Promoted the performance by over **6%** compared to the network without any regularizer, by over **4%** compared with Dropout.

### Weakly supervised semantic segmentation with convolutional neural networks

Jun. 2015 - Oct. 2016

- Problem: CNNs have achieved great success on image segmentation with pixel level supervision, which is expensive to obtain.
- Developed CNN-based weakly supervised segmentation methods, to classify the pixels with only the image level labels.

## Rich and robust feature pooling for unsupervised feature representation

Feb. 2015 - Jun. 2015

- Proposed a novel pooling method improved from the conventional Max and Average pooling, that leverages the sparsity of features and can significantly reduce the impact of the noise.
- Extracted both local and global features, to learn rich representations in an unsupervised way.
- Achieved nearly **4%** promotion on visual recognition tasks compared with Max and Average pooling.

## Deep unsupervised neural networks for feature representation

Feb. 2014 - Feb. 2015

- Proposed a deep unsupervised network to learn deep feature representations from images without any labelling information.
- The network is constructed by stacking denoising auto-encoders convolutionally. It's trained layer-wisely to relieve gradient vanishing.
- The proposed network outperforms the convolutional unsupervised networks, with an over **10%** promotion on some datasets.

## Experience

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### Tencent AI Lab

Shen Zhen, China

INTERNSHIP

Jul. 2017 - Sep. 2017

- Worked with Dr. Wenhan Luo and Dr. Lin Ma on Time-lapse Video Generation project.
- generate realistic future scenes with a multi-stage dynamic generative adversarial network given only the first frame.

### Laboratoire d'Informatique Gaspard-Monge (LIGM)

Paris, France

RESEARCH ASSISTANT

Jul. 2015 - Sep. 2015

- Worked with Dr. Chaohui Wang on the project of "**Weakly Supervised Semantic Segmentation with Convolutional Networks**".
- Developed a weakly supervised method for image segmentation based on fully convolutional networks. Under development now.

## Honors

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Dec. 2016 Pacemaker to **Outstanding Graduate Student**.

Dec. 2016 ICDM 2016 **Student Travel Award**.

Oct. 2016 **National Scholarship**.

Jun. 2014 **Honored Graduate Award** of HONGYI School

Feb. 2009 2nd prize of **Chinese Mathematical Olympiad** (CMO) in Senior, Provincial Division.

## Skills

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Language Python, Matlab, C/C++, CUDA

Tools Theano, Torch 7, Matlab, Caffe, MXNet