

# Huikai Wu

PHD STUDENT

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## Summary

### Deep Learning Researcher

GOOGLE SCHOLAR

I'm currently a PhD candidate student at Institute of Automation, Chinese Academy of Sciences, affiliated with National Laboratory of Pattern Recognition and supervised by Professor Kaiqi Huang. I work on image processing, computer vision and deep learning. My research interests are pixel-level image understanding, neural architecture search and model acceleration.

## Research Experience

### Preferred Networks

INTERNATIONAL INTERN

Tokyo, Japan

July, 2018 - Oct. 2018

- Website: <https://www.preferred-networks.jp/en/>
- Neural Architecture Search for Pixel-level Image Understanding

## Education

### CASIA (Institute of Automation, Chinese Academy of Sciences)

PHD IN COMPUTER VISION AND DEEP LEARNING

Beijing, China

Sep. 2015 - Present

Topic: Pixel-level image understanding GPA: 3.67/4

### NJU (Nanjing University)

B.S. IN SOFTWARE ENGINEERING

Nanjing, China

Sep. 2011 - Jun. 2015

Thesis: Deep Active Learning GPA: 3.87/4 Rank: 5/257

## Publications

### SparseMask: Differentiable Connectivity Learning for Dense Image Prediction

Project Website

HUIKAI WU, JUNGE ZHANG, KAIQI HUANG

IEEE International Conference on Computer Vision (ICCV), 2019

### FastFCN: Rethinking Dilated Convolution in the Backbone for Semantic Segmentation

Project Website

HUIKAI WU, JUNGE ZHANG, KAIQI HUANG, KONGMING LIANG, YIZHOU YU

arXiv preprint arXiv:1903.11816

### Fast End-to-End Trainable Guided Filter

Project Website

HUIKAI WU, SHUAI ZHENG, JUNGE ZHANG, KAIQI HUANG

IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2018

### GP-GAN: Towards Realistic High-Resolution Image Blending

Project Website

HUIKAI WU, SHUAI ZHENG, JUNGE ZHANG, KAIQI HUANG

ACM International Conference on Multimedia (ACMMM), 2019, oral

### Fast A3RL: Aesthetics-Aware Adversarial Reinforcement Learning for Image Cropping

Paper

DEBANG LI, HUIKAI WU, JUNGE ZHANG, KAIQI HUANG

IEEE Transactions on Image Processing ( Volume: 28 , Issue: 10 , Oct. 2019 )

### A2-RL: Aesthetics Aware Reinforcement Learning for Image Cropping

Project Website

DEBANG LI, HUIKAI WU, JUNGE ZHANG, KAIQI HUANG

IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2018

### MSC: A Dataset for Macro-Management in StarCraft II

Project Website

HUIKAI WU, JUNGE ZHANG, KAIQI HUANG

arXiv preprint arXiv:1710.03131

## Highlighted Research Experience

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### SparseMask: Differentiable Connectivity Learning for Dense Image Prediction

PROJECT WEBSITE

We propose a novel sparse loss for differentiable neural architecture search, which automatically designs the connectivity structure for dense prediction tasks following the encoder-decoder style, achieving better fusion of multi-scale and multi-resolution feature maps.

### FastFCN: Rethinking Dilated Convolution in the Backbone for Semantic Segmentation

PROJECT WEBSITE

We propose a novel joint upsampling module named Joint Pyramid Upsampling (JPU) to replace dilated convolutions in the backbone for semantic segmentation. With the proposed JPU, our method reduces the computation complexity by more than three times and achieves the state-of-the-art performance.

### Fast End-to-End Trainable Guided Filter

PROJECT WEBSITE

We present a deep learning block for joint upsampling, which aims at generating high-resolution output for dense prediction tasks. With the proposed block, we achieve the state-of-the-art performance and run 10-100 times faster.

## Honors & Awards

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### INTERNATIONAL

2017 **4th Place**, StarCraft Competition in AIIDE 2017 [Leaderboard].

## Academic Activities

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### REVIEWERS

2019 - CVPR 2019-2020, ICCV 2019, AAAI 2020, TETCI, TMI, TSMC,

## Project

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### DeepJS

PROJECT WEBSITE

Online demos for my research in image processing and computer vision based on deep learning.

Apr. 2019

### Face Swap

PROJECT WEBSITE

Swap face between two photos with Python 3, OpenCV and dlib.

Jan. 2018

### Chainer implementation of Pix2Pix

PROJECT WEBSITE

Chainer implementation of *Image-to-Image Translation Using Conditional Adversarial Networks*

Mar. 2017

### Chainer version of neural-style and fast-neural-style

PROJECT WEBSITE

Chainer implementation of *A Neural Algorithm of Artistic Style* and *Perceptual Losses for Real-Time Style Transfer and Super-Resolution*

Mar. 2017

### Chainer implementation of realismCNN

PROJECT WEBSITE

Chainer implementation of realismCNN proposed in *Learning a Discriminative Model for the Perception of Realism in Composite Images*

Mar. 2017

## References

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### Prof. Kaiqi Huang

Homepage

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National Lab. of Pattern Recognition, Institute of Automation, Chinese Academy of Science

### Dr. ShuaiZheng

Homepage

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