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 *Tokyo, Japan*

International Intern *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) *Beijing, China*

PHD in Computer Vision and Deep Learning *Sep. 2015 - Present*

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

NJU (Nanjing University) *Nanjing, China*

B.S. in Software Engineering *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

arXiv preprint arXiv:1904.07642

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

arXiv preprint arXiv:1703.07195

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

Debang Li, **Huikai Wu**, Junge Zhang, Kaiqi Huang

IEEE Transactions on Image Processing (Early Access)

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

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

International

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

Academic Activities

Reviewers

2019 **ICCV 2019, CVPR 2019**, Reviewer

Project

DeepJS *Apr. 2019*

Project Website

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

Face Swap *Jan. 2018*

Project Website

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

Chainer implementation of Pix2Pix *Mar. 2017*

Project Website

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

Chainer version of neural-style and fast-neural-style *Mar. 2017*

Project Website

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

Chainer implementation of realismCNN *Mar. 2017*

Project Website

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

References

Prof. Kaiqi Huang

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

Dr. ShuaiZheng

Homepage *E-mail: szhengcvpr@gmail.com*

Research Scientist, eBay AI, San Francisco, CA, US