Junpeng Jing

Curriculum Vitae

Beihang University, C.N.
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Final-year Master Student

EDUCATION

2020.9 – Present
Master, *Dept. of Cyber Science and Technology*, Beihang University, C.N..
- GPA: 3.85/4.0 (1/26)
  - Group: Multimedia Computing Towards Communications (MC2 Lab)
  - Topics: **Stereo Image Super-resolution**, **Image Hiding**, **Compression**
  - Advisor: Prof. Zhenyu Guan, Prof. Mai Xu and Dr. Xin Deng

2016.9 – 2020.7
Bachelor, *Dept. of Electronic Information Engineering*, Beihang University, C.N..
- GPA: 3.58/4.0

INTERNSHIP EXPERIENCE

2022.5 – Present
Research Intern, *IS Group*, MEGVII Technology (also known as Face++, in July, 2016).
- Topic: **Stereo Matching**
- Advisor: Jiankun Li and Jiangyu Liu

RESEARCH INTERESTS

Stereo Matching, Super-resolution, Compression and Reversible Image Conversion.

PUBLICATIONS

The publications are also listed in my *Google Scholar Page*.

2022 [1] Zhenyu Guan[1], **Junpeng Jing**[1] (co-first author), Xin Deng, Mai Xu, Lai Jiang, Zhou Zhang, Yipeng Li. *DeepMIH: Deep Invertible Network for Multiple Image Hiding.* IEEE Transactions on Pattern Analysis and Machine Intelligence (**TPAMI**). (*Paper*) (*Code*)

2021 [2] **Junpeng Jing**, Xin Deng, Mai Xu, Jianyi Wang, Zhenyu Guan. *HiNet: Deep Image Hiding by Invertible Network.* Proceedings of the IEEE/CVF International Conference on Computer Vision (**ICCV**). (*Paper*) (*Code*)

COMPETITIONS

2022 [1] **Winner** (**1st** place) at Robust Vision Challenge 2022, **ECCV Workshop**. (*Link*)
– Stereo Matching Track ***1st Author***

2022 [2] **6th** place at NTIRE Challenge 2022, **CVPR Workshop** (*Link*)
– Stereo Image Super-resolution Track ***1st Author***

PATENT

2022 [1] An Image Hiding Technology and Method. C.N. 202011290006.9

RESEARCHES

Researches on Image Hiding

2020.7 –
2020.12
HiNet: Deep Image Hiding by Invertible Network, ICCV2021.
- Main works:
  - We propose a novel image hiding network, namely HiNet, based on invertible neural network for the task of large-capacity image hiding.
  - We design two concealing and revealing modules with differentiable and invertible property, aiming to make the image hiding process fully reversible.
  - We propose a low-frequency wavelet loss to control the distribution of secret information in different frequency bands, which significantly improves the hiding security.

2021.1 –
2022.1
DeepMIH: Deep Invertible Network for Multiple Image Hiding, TPAMI2022.
- Main works:
  - We propose a novel invertible multiple image hiding framework, to hide multiple secret images into the same cover image in a new manner.
  - We investigate two important findings about image hiding, which lay great foundations for the network and loss function design for multiple image hiding.
  - We propose an importance map module to guide the current image hiding with the results of previous image hiding, to fully utilize the hiding potential of cover image.
  - We develop a new multi-stage training strategy with the designed stage losses, to improve the training stability and the performance of multiple image hiding.

Researches on Stereo Image Process

2022.1 –
2022.4
StereoSRT: A Stereo Image Super-Resolution Transformer, NTIRE2022 Challenge.
- Main works:
  - We propose a transformer based architecture for stereo image super-resolution, simultaneously leverage the self and cross information between stereo image pairs.
  - We introduce a 2-stage training strategy and design a U-Net based backbone, which re-use the original input to further enhance the output from super-resolution.

2022.5 –
Present
CREStereo++: Cascaded Recurrent Network for Robust Stereo Matching, Robust Vision Challenge 2022.
- Main works:
  - We proposed a cascaded recurrent network for robust stereo matching, which has a simplified backbone without any attention mechanism and achieves better performance than CREStereo.
  - We introduce a learnable warping module to effectively alleviate the occlusion and mismatch problem caused by traditional warping operation.
  - We propose a multi-scale patch match correlation module, to replace the pixel-based local correlation in the original version, achieving accurate matching results.
- Our method CREStereo++_RVC is ranked 1st on ETH3D and Middlebury, and is ranked 2nd on KITTI2015, thereby achieving the overall rank 1st for the stereo matching task.
- In preparing for CVPR 2023.

SCHOLARSHIPS

2022	Top-10 Graduate Students	*Top 0.5%, 10,000¥*
	– Highest honor of the postgraduate in BUAA	
2021	National Scholarship	*Top 1%, 20,000¥*
	– Directly Awarded by the National Ministry of Education	
2021	Postgraduate Academic Scholarship	*1st Prize, 7,500¥*
2020	Postgraduate Academic Scholarship	*2nd Prize, 5,000¥*
2017	Science and Technology Scholarship of Beihang University	*2nd Prize, 1,000¥*

HONORS & AWARDS

2021	Outstanding Graduate Student	***Top 5%***
2021	Merit Student	***Top 5%***
2019	National College-student Electronics Design Contest	***1st Author & 2nd Prize***
2019	29th Fengru Cup "Nokia" Innovation Contest	***1st Author & 2nd Prize***
2018	Beijing College-student Electronics Design Contest	***1st Author & 2nd Prize***
2018	COMAP's Mathematical Contest in Modeling	***Honorable Winner***
2017	27th "Feng Ru Cup" Competition of Innovation	***1st Author & 3rd Prize***

PROJECTS

2018 – 2019	National College Student Innovation and Entrepreneurship Training Program – Autonomous Tracking UAV Based on Deep Learning	***1st Author***

SKILLS

Programming: Matlab, Python (PyTorch)

Word processing: LaTeX, Microsoft Office, Adobe Illustrator

Languages: Chinese, English (CET-4 CET-6, IELTS)

Daily-Hobbies: Bodybuilding, Basketball, Chess