XIAOHONG LIU

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PERSONAL SUMMARY

I'm a forth-year Ph.D. candidate at McMaster University. My research direction aims at video and image processing based on deep learning, especially in restoration, classification, recognition, and manipulation/abnormal detection. As an AI researcher, I'm always energetic and enthusiastic to implement cutting-edge AI techniques and have already published several papers on the top journal and conference (e.g., TIP and ICCV). In order to gain industrial experience, I have interned in several companies to develop practical AI products.

EDUCATION

McMaster University Hamilton, Canada
Doctor of Philosophy in Electrical and Computer Engineering *Jan. 2018 – Current*

Michigan State University East Lansing, U.S.
Visiting Scholar, supervised by Dr. Xiaoming Liu *May 2020 – Dec. 2020*

University of Ottawa Ottawa, Canada
Master of Applied Science in Electrical and Computer Engineering *Sep. 2014 – Dec. 2016*

Southwest Jiaotong University Chengdu, China
Bachelor of Engineering in Telecommunication *Sep. 2010 – Jul. 2014*

TECHNICAL SKILLS

Python: 4-year programming experience to implement cutting-edge techniques in computer vision.
Matlab: 6-year programming experience. Proficient in APIs for image processing.
AI framework: Proficient in PyTorch/Torch and Tensorflow. Good knowledge in Caffe.
Linux: Use Ubuntu in daily developing. Familiar with commonly used Linux commands. Able to use SSH to access remote servers. Able to write bash scripts for batch processing.
Others: Git/Github, Agile Development, C/C++ and etc.

WORK EXPERIENCE

IBM May 2019 – Aug. 2019
IoT & AI Developer - Coop *Toronto, Canada*

- Interned in IBM as an IoT & AI developer and responsible for two projects: 1) time series forecasting that infers bathroom footfalls based on sensor-collected data to make Bell office-building intelligent in sense of setting dynamic cleanup schedules; 2) open-set face recognition, where open-set means there might be an unknown face showing up in testing. 99% recognition accuracy has been achieved in this system.

Cymax Group Jan. 2019 – Jun. 2019
Research Intern *Burnaby, Canada*

- Interned in Cymax Group as an AI/Machine researcher and responsible for developing a neural network that can predict the optimal price-cost trade-off for each selling product to maximize the chance of winning the competition against other companies in Amazon. Specifically, a novel 1D convolutional neural network was designed that enables to use long-range historical sales data to produce the winning strategy.

Car Media 2.0 Apr. 2018 – Dec. 2018
Research Intern *Burlington, Canada*

- Interned in Car Media 2.0 Dev team and responsible for developing an automated deep alpha-matting tool for Vehicle image. This tool recognizes vehicles from image background without any human intervention.

COMPUTER VISION COMPETITIONS

- Won a Runner-Up Award (2nd place) in AIM 2020 Challenge on Learned ISP (in conjuction with ECCV 2020).
- Ranked the 3rd place in AIM 2020 Challenge on Efficient Super-Resolution (in conjunction with ECCV 2020).
- Ranked the 3rd place in NTIRE 2020 Challenge on Image Demoireing (in conjunction with CVPR 2020).

PUBLICATION

Google Scholar: 150+ citations. ∗: co-first authors, †: the corresponding author.

Journal:

1. **Liu, X.**, Chen, L., Wang W., and Zhao, J.† Robust Multi-Frame Super-Resolution Based on Spatially Weighted Half-Quadratic Estimation and Adaptive BTV Regularization. *IEEE Transactions on Image Processing*, 2018. PDF
2. **Liu, X.**†, Shi, K., Wang, Z., and Chen, J. Exploit Camera Raw Data for Video Super-Resolution via Hidden Markov Model Inference. *IEEE Transactions on Image Processing*, 2021. PDF
3. Shi, Z., **Liu, X.**†, Shi, K., Dai, L., and Chen, J. Video Frame Interpolation via Generalized Deformable Convolution, *IEEE Transactions on Multimedia*, 2021. PDF
4. Wang, W., Hu, J., **Liu, X.**†, Zhao, J., and Chen, J. Single image super-resolution based on multi-scale structure and nonlocal smoothing. *To appear in EURASIP Journal on Image and Video Processing*.
5. **Liu, X.**, Shi, Z., Wu, Z., and Chen, J†. GridDehazeNet+: An Enhanced Multi-Scale Network with Intra-Task Knowledge Transfer for Single Image Dehazing. *Under reviewed in IEEE Transactions on Image Processing*. PDF
6. Shi, Z., Li, C., Dai, L., **Liu, X.**†, Chen, J., and Davidson, T. N. Learning for Unconstrained Space-Time Video Super-Resolution. *Under reviewed in IEEE Transactions on Multimedia*. PDF

Conference:

1. **Liu, X.**, and Zhao, J. Robust Multi-Frame Super-Resolution with Adaptive Norm Choice and Difference Curvature based BTV Regularization. *IEEE Global Conference on Signal and Information Processing (GlobalSIP)*, 2017. PDF
2. Zhou, Y., **Liu, X.**, and Zhao, J. Video Super-Resolution via Dynamic Local Filter Network. *IEEE Global Conference on Signal and Information Processing (GlobalSIP)*, 2018. PDF
3. Shi, K., **Liu, X.**, Guo, X., Lin, J., Alrabeiah, M., Liu, H., and Chen, J. Image Retrieval via Canonical Correlation Analysis. *16th Canadian Workshop on Information Theory (CWIT)*, 2019. PDF
4. **Liu, X.**∗, Ma, Y.∗, Shi, Z., and Chen, J. GridDehazeNet: Attention based Multi-Scale Network for Image Dehazing. *IEEE International Conference on Computer Vision (ICCV)*, 2019. PDF
5. **Liu, X.**, Kong, L., Zhou, Y., Zhao, J., and Chen, J. End-to-End Trainable Video Super-Resolution Based on a New Mechanism for Implicit Motion Estimation and Compensation. *IEEE Winter Conference on Applications of Computer Vision (WACV)*, 2020. PDF
6. Dai, L.∗, **Liu, X.**∗, Li, C., and Chen J. AWNet: Attentive Wavelet Network for Image ISP. *European Conference on Computer Vision Workshop (ECCVW)*, 2020. PDF
7. **Liu, X.**, Liu, Y., Chen J., and Liu, X. PSCC-Net: Progressive Spatio-Channel Correlation Network for Image Manipulation Detection and Localization. *Under reviewed in IEEE International Conference on Computer Vision (ICCV)*, 2021. PDF
8. Dai, L.∗, Song, X.∗, **Liu, X.**∗, Li, C., Shi, Z., Chen, J., and Brooks, M. Enabling Trimap-Free Image Matting with a Frequency-Guided Saliency-Aware Network via Joint Learning. *Under reviewed in IEEE International Conference on Computer Vision (ICCV)*, 2021.

PROFESSIONAL ACTIVITIES

- Joint the executive team in McMaster AI Society as a senior project manager.
- Journal review: *IEEE Transactions on Image Processing*, *IEEE Transactions on Multimedia*, *IEEE Transactions on Broadcasting*, *IEEE Transactions on Circuits and Systems for Video Technology*, *IEEE Transactions on Intelligent Transportation Systems*.
- Conference review: *PG 2020*, *WACV 2020*, *ICCV 2021*.

AWARDS

- Won the 2019-20 BorealisAI Global Fellowship award (one of the **10** nominees in Canada!). Details can be found here.
- Awarded an Alexander Graham Bell Canada Graduate Scholarship-Doctoral from Natural Sciences and Engineering Research Council of Canada (NSERC). This is the **best** scholarship for Ph.D. students in Canada.
- Awarded an Ontario Graduate Scholarship. This is a merit-based scholarship provided by the Province of Ontario in Canada.
- Awarded an McMaster Graduate Scholarship.