Yao Luo

Contact Information

School of Computer Science and Engineering
Nanjing University of Science and Technology
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https://joangraphic.github.io

Research Interests

Computer Vision, Machine learning, Signal Processing, Video Enhancement.

Education

Nanjing University of Science and Technology — Nanjing, China
Ph.D., Computer Science and Engineering, GPA: 3.9/4.0 — 2018/09 - 2023/11

- Dissertation Topic: "Adaptive Fusion Approaches in Deep Neural Networks for Video Enhancement Tasks" (Advisor: Prof. Jinhui Tang, Prof. Jinshan Pan)
- Awards: Academic Scholarship, Nanjing University of Science and Technology, 2018 - 2022

Texas A&M University — College Station, TX, USA
M.E., Electrical Engineering, GPA: 4.0/4.0 — 2013/08 - 2018/05

- Awards: Travel Grant Award, The International Conference on Electron, Ion and Photon Beam Technology and Nanofabrication (EIPBN), 2017

Southeast University — Nanjing, China
B.E., Electronic Science and Technology, GPA: 3.6/4.0 — 2009/08 - 2013/06

- Awards: Presidential Scholarship, Southeast University, 2012; The First Prize, Contemporary Undergraduate Mathematical Contest in Modeling, 2011

Research Experience

Nanjing University of Science and Technology — Nanjing, China
Doctoral student, Intelligent Media Analysis Group — 2018/09 - present

- Designed a bi-directional pseudo-3D neural network and a multi-task collaborative learning strategy that exploit the correlation between motion estimation and depth-related occlusion estimation to handle dynamic scenes with complex motions and occlusions for video frame interpolation. This research resulted in a journal paper in IEEE Transactions on Image Processing.
- Designed a lightweight neural network and a spatiotemporal variance-aware loss that leverage self-supervised and supervised joint training to construct motion volumes via ensembles of offset approximations for efficient video frame interpolation, enriching expressiveness of the compact network by learning diverse member approximations. This research resulted in a conference paper in ICASSP 2023.
- Designed a compact bi-branch network based on an encoder-decoder structure by introducing heterogeneous depth-wise separable transformations and a lightweight nonlocal adaptive feature fusion method to mitigate the burden of learning intertwined mapping of correlations with distinct properties for efficient video deblurring of dynamic scenes. This research resulted in a journal paper in Computer Vision and Image Understanding.

Texas A&M University — College Station, TX, USA
Graduate Student, Rendering and Shading Group, Department of Visualization — 2017/09 - 2017/12

- Implemented an interactive graphical user interface for real-time 3D rendering and shading using OpenGL and Qt.

Siemens EDA (formerly Mentor Graphics) — Fremont, CA, USA
Modeling Intern - Semi-Manufacturing, Design-to-Silicon Division — 2017/06 - 2017/08

- Derived the analytical general solutions for the partial differential equations of 1D, 2D and 3D resist shrinkage physical models, and implemented the resist shrinkage models as Matlab functions, being acknowledged by Dr. Yuri Granik in his SPIE conference paper "Yuri Granik, Analytical solutions for the deformation of a photoresist film, Proceedings of SPIE 10961, Optical Microlithography XXXII, 109610D, SPIE Advanced Lithography, California, USA, February, 2019" for valuable contributions.

Texas A&M University College Station, TX, USA
Graduate Student & TA, Department of Electrical and Computer Engineering 2016/08 - 2017/05

- Analyzed metrology error for Line-Edge Roughness measurement in low-dose SEM images by simulating random rough lines via the Thorsos method, and designed Multitaper and Multisegment power spectrum estimation methods for simultaneously reducing uncertainty and bias in Line-Edge Roughness characterization, resulting in an EIPBN oral presentation, a SPIE conference paper and a journal paper in Journal of Micro/Nanolithography, MEMS, and MOEMS.
- Lead labs for ECEN 455 Digital Communications, Spring 2017.
- Lead labs and recitation sections for ECEN 214 Electrical Circuit Theory, Fall 2016.

Graduate Student & RA, Department of Electrical and Computer Engineering 2013/08 - 2016/06

- Analyzed photo mask data for lossless compression and designed Paeth-EPC algorithms to improve lossless layout image compression ratio for electron beam lithography systems, resulting in a SPIE conference paper and two journal papers in Journal of Vacuum Science & Technology B.

Publications

1. **Yao Luo**, Jinshan Pan, Jinhui Tang, SVMV: Spatiotemporal variance-supervised motion volume for video frame interpolation, *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, Rhodes Island, Greece, June, 2023. (CCF B)
2. **Yao Luo**, Jinshan Pan*, Jinhui Tang*, Bi-directional pseudo-three-dimensional network for video frame interpolation, *IEEE Transactions on Image Processing (TIP)*, vol. 31, pp. 6773-6788, 2022. (CCF A, SCI, IF: 11.041)
3. **Yao Luo**, Zhong-Hui Duan, Jinhui Tang*, Bi-branch network for dynamic scene deblurring, *Computer Vision and Image Understanding (CVIU)*, vol. 202, pp. 103100, 2021. (CCF B, SCI, IF: 4.886)
4. **Yao Luo*** and Serap A. Savari, Multitaper and multisegment spectral estimation of line-edge roughness (extended version), *Journal of Micro-Nanolithography MEMS and MOEMS (JM3)*, vol.16(3), pp. 034001, 2017. (SCI)
5. **Yao Luo** and Serap A. Savari, Reduction of metrology error for line-edge roughness measurement from low-dose SEM images, *International Conference on Electron, Ion, and Photon Beam Technology and Nanofabrication (EIPBN)*, Florida, USA, June, 2017.
6. **Yao Luo** and Serap A. Savari, Multitaper and multisegment spectral estimation of line-edge roughness, *SPIE Advanced Lithography*, California, USA, February, 2017.
7. Narendra Chaudhary, **Yao Luo**, and Serap A. Savari*, Impact of parallelism on data volumes for a multibeam mask writer, *Journal of Vacuum Science & Technology B (JVST B)* 34, 06KF01, 2016. (SCI)
8. Narendra Chaudhary, **Yao Luo**, and Serap A. Savari, A parallel multibeam mask writing method and its impact on data volumes, *European Mask and Lithography Conference*, Dresden, Germany, June, 2016.
9. Narendra Chaudhary, **Yao Luo**, and Serap A. Savari*, Lossless layout image compression algorithm for electron-beam direct-write lithography , *Journal of Vacuum Science & Technology B (JVST B)* 33, 06FD01, 2015. (SCI)

Conference Presentations

1. **Yao Luo**, Jinshan Pan and Jinhui Tang, SVMV: Spatiotemporal variance-supervised motion volume for video frame interpolation, *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, Rhodes Island, Greece, June, 2023.
2. **Yao Luo** and Serap A. Savari, Reduction of metrology error for line-edge roughness measurement from low-dose SEM images, *International Conference on Electron, Ion, and Photon Beam Technology and Nanofabrication (EIPBN)*, Florida, USA, June, 2017.

Professional Services

- Reviewer for IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP 2024 in Seoul, Korea)
- Reviewer for China Multimedia Conference (ChinaMM 2023 in Kunming, China)
- Volunteer for NExT++ workshop (NExT++ workshop 2018 in Nanjing, China)