

Siwei Lyu

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EDUCATION

Ph.D., Computer Science, Dartmouth College, Hanover, NH, August 2005
Advisor: Prof. Hany Farid
Dissertation: *Natural Image Statistics for Digital Image Forensics*
M.S., Computer Science and Technology, Peking University, Beijing, China, June 2000
Advisor: Prof. Xuan Wang
Thesis: *Component-based Software Architecture for Multimedia Authoring Systems*
B.S., Information Science, Peking University, Beijing, China, June 1997

PROFESSIONAL EXPERIENCE

Professor, SUNY Empire Innovation	2020 – present
Department of Computer Science and Engineering University at Buffalo, State University of New York, Buffalo, NY	
Professor	2019 – 2020
Computer Science Department University at Albany, State University of New York, Albany, NY	
Associate Professor	2014 – 2019
Computer Science Department University at Albany, State University of New York, Albany, NY	
Assistant Professor	2008 – 2014
Computer Science Department University at Albany, State University of New York, Albany, NY	
Postdoctoral Fellow	2005 – 2008
Howard Hughes Medical Institute, New York, NY Center for Neural Science, New York University	
Assistant Researcher	2000 – 2001
Microsoft Research Asia, Beijing, China	

HONORS AND AWARDS

Google Faculty Research Award,	Google Inc,	2019
Chancellor’s Award for Excellence in Research,	State University of New York,	2019
President’s Award for Excellence in Research,	University at Albany, SUNY,	2018
Best Paper Award,	IEEE Signal Processing Society,	2011
Faculty Early Career (CAREER) Award,	National Science Foundation,	2010
Faculty Research Award Program (FRAP-A),	University at Albany, SUNY,	2009, 2012, 2015

GRANTS

External

- PI. Safe: Source agnostic deepfake detector. AFRL STTR Phase I (collaboration with IAI Inc.), \$15,000, 2021.
- PI. A study of new aggregate losses for machine learning. National Science Foundation, Project IIS-2008532, \$448,333, 2020-2023.

- PI. Semantic Information Defender (SID). DARPA Semantic Forensics (SemaFor) Program, \$448,000, 2020 - 2024.
- Co-PI. Yard locomotion detection system development. General Electronics (GE), \$200,000, 2019-2020.
- Awardee. Google AI. Google Faculty Research Award, \$50,000, 2019.
- Co-PI. Online AUC maximization algorithms for streaming data. National Science Foundation, Project IIS-1816227, \$498,333, 2018-2021.
- PI. New approaches to combine individual losses. Army Research Office, Project 81852, \$375,000, 2018-2021.
- Co-PI. Data collection and preparation. IARPA, Deep Insight of Vision Algorithms (DIVA) Program, \$75,000, 2018-2019.
- Co-PI. Advanced metric learning for big data analysis. UAlbany Presidential Innovation Fund for Research and Scholarship, \$50,000, 2017-2018.
- PI. Photons, pixels, photoshop and the Internet: Analyzing the life-cycle integrity of visual media. DARPA Media Forensics (MediFor) Program, FA8750-16-C-0166, \$448,000, 2016 - 2020.
- Co-PI. Continuation: A dynamic Bayesian approach to real-time estimation and filtering in grasp acquisition and other contact tasks. National Science Foundation, National Robotics Initiative (NRI) Project IIS-1537257, \$220,000, 2015 - 2019.
- Co-PI. Practitioner centric video analysis. National Institute of Justice Project, 2013-IJ-CX-K010, \$100,000, 2013 - 2015.
- PI. Blind noise estimation using signal statistics in random band-pass domains. National Science Foundation, Project CCF-1319800, \$400,000, 2013-2017.
- Co-PI. A dynamic Bayesian approach to real-time estimation and filtering in grasp acquisition and other contact tasks. National Science Foundation, National Robotics Initiative (NRI), Project, IIS-1208463, \$210,000, 2012-2016.
- Co-PI. Recognizing group behavior in surveillance videos. National Institute of Justice, \$40,000, 2011 - 2013.
- Awardee. A new statistical framework for natural images with applications in vision. National Science Foundation Early Faculty Career Development Award, Project, IIS-0953373, \$500,000, 2010-2015.
- Co-PI. Compressing and mining GPS stream data. University Transportation Research Center, \$99,848, 2009-2010.
- Co-PI. Statistical patterns to detect financial fraud. IBM Research Center, \$40,000, 2009 - 2010.

Internal

- Awardee. 3D Tracking Visualization from Surveillance Videos. UAlbany Faculty Research Award (Category A), \$10,000, 2015-2018.
- Awardee. Exposing digital forgeries using blind local noise level estimation. UAlbany Faculty Research Award (Category A), \$10,000, 2012-2015.
- Awardee. Seeing the unseen: Natural image statistics for digital forensics. UAlbany Faculty Research Award (Category A), \$10,000, 2009-2012.

PUBLICATIONS

Google Scholar: <https://scholar.google.com/citations?user=wefAEM4AAAAJ&hl=en>
 DBLP: <http://dblp.uni-trier.de/pers/hd/l/Lyu:Siwei>
 ORCID: <https://orcid.org/0000-0002-0992-685X>
 Total citations: 8,686, h-index: 43, i10-index: 82

Books

B1. **Siwei Lyu**. *Natural Image Statistics in Digital Image Forensics*. VDM Verlag, 2008.

Book Chapters

BC2. **Siwei Lyu**. Ai-generated deepfakes and the challenge of detection. In Jesse Emspak, editor, *Technology vs. Truth: Deception in the Digital Age*, chapter 3.4. Scientific American (e-book), 2020.

BC1. **Siwei Lyu**. Natural image statistics for digital image forensics. In H. T. Sencar and N. Memon, editors, *Digital Image Forensics: There is More to a Picture than Meets the Eye*. Springer, 2012.

Refereed Journal Articles

- J29. [TCYB21] Lipeng Ke, Ming-Ching Chang, Longyin Wen, Honggang Qi, and **Siwei Lyu**. Fast online video pose estimation by dynamic Bayesian modeling of mode transitions. *IEEE Transactions on Cybernetics*, 51(1):2–15, 2021. (impact factor: 8.803).
- J28. [MIA20] Jing Hu, Ziwei Luo, Xin Wang, Shanhui Sun, Youbing Yin, Kunlin Cao, Qi Song, **Siwei Lyu**, and Xi Wu. End-to-end multimodal image registration via reinforcement learning. *Medical Image Analysis*, 68:101878, 2021. (impact factor: 11.280).
- J27. [PAMI20] **Siwei Lyu**, Yanbo Fan, Yiming Ying, and Baogang Hu. Average top-k loss for supervised learning. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, (accepted), 2020. (impact factor: 17.730).
- J26. [ACCESS20] Yanbo Fan, Baoyuan Wu, Ran He, Baogang Hu, Yong Zhang, and **Siwei Lyu**. Groupwise ranking loss for multi-label learning. *IEEE Access*, to appear, 2020. (impact factor: 4.098).
- J25. [CVIU20] Longyin Wen, Dawei Du, Zhaowei Cai, Zhen Lei, Ming-Ching Chang, Honggang Qi, Jongwoo Lim, Ming-Hsuan Yang, and **Siwei Lyu**. UA-DETRAC: A New Benchmark and Protocol for Multi-Object Detection and Tracking. *International Journal on Computer Vision and Image Understanding (CVIU)*, 193:102907, 2020. (impact factor: 2.645).
- J24. [FRONTIER19] Michael Anthony Natole, Yiming Ying, and **Siwei Lyu**. Stochastic AUC optimization algorithms with linear convergence. *Frontiers in Applied Mathematics and Statistics, section Mathematics of Computation and Data Science*, 2019. (impact factor: 3.678).
- J23. [SPL19] Zhe Xue, Dawei Du, Qingming Huang, and **Siwei Lyu**. Deep constrained low-rank subspace learning for multi-view semi-supervised classification. *IEEE Signal Processing Letters*, 2019. (impact factor: 3.268).
- J22. [INFOSCI19] Zhe Xue, Junping Du, Dawei Du, and **Siwei Lyu**. Deep low-rank subspace ensemble for multi-view clustering. *Information Science*, 482:210–227, 2019. (impact factor: 4.305).
- J21. [IJCV19] Longyin Wen, Zhen Lei, **Siwei Lyu**, and Stan Z. Li. Single-shot scale-aware network for real-time face detection. *International Journal of Computer Vision*, 127(6-7):537–559, 2019. (impact factor: 11.541).
- J20. [PR18] Xin Wang, Ming-Ching Chang, Lan Wang, and **Siwei Lyu**. Efficient algorithms for graph regularized PLSA for probabilistic topic modeling. *Pattern Recognition*, 86:236–247, February 2018. (impact factor: 3.962).
- J19. [IJCV18] Baoyuan Wu, Bernard S. Ghanem, Wei Liu, and **Siwei Lyu**. Multi-label learning with missing labels using mixed dependency graphs. *International Journal of Computer Vision*, 126(8):875 – 896, 2018. (impact factor: 11.541).
- J18. [TOMM18] Longyin Wen, Honggang Qi, and **Siwei Lyu**. Contrast enhancement estimation for digital image forensics. *ACM Transactions on Multimedia Computing, Communications and Applications*, 14(2):49:1–49:21, 2018. (impact factor: 2.019).
- J17. [SCIS18] Hui Zeng, Jingjing Yu, Xiangui Kang, and **Siwei Lyu**. Countering JPEG anti-forensics based on noise level estimation. *Science China Information Sciences*, 61:032103, 2018. (impact factor: 2.188).

- J16. [TIP17] Dawei Du, Longyin Wen, Honggang Qi, Qingming Huang, Tian Qi, and **Siwei Lyu**. Iterative graph seeking for object tracking. *IEEE Transactions on Image Processing*, 27(4):1809–1821, 2017. (impact factor: 5.071).
- J15. [TCYB17] Dawei Du, Honggang Qi, Longyin Wen, Qingming Huang, Tian Qi, and **Siwei Lyu**. Geometric hypergraph learning for visual tracking. *IEEE Transactions on Cybernetics*, 47(12):4182–4195, 2017. (impact factor: 8.803).
- J14. [IJCV16] Longyin Wen, Zhen Lei, Ming-Ching Chang, Honggang Qi, and **Siwei Lyu**. Multi-camera multi-target tracking with space-time-view hyper-graph. *International Journal of Computer Vision*, 122(2):313–333, 2016. (impact factor: 11.541).
- J13. [TIP16] Dawei Du, Honggang Qi, Wenbo Li, Longyin Wen, Qingming Huang, and **Siwei Lyu**. On-line deformable object tracking based on structure-aware hyper-graph. *IEEE Transactions on Image Processing*, 25(8):3572 – 3584, 2016. (impact factor: 5.071).
- J12. [TCVG16] Yan Kong, Weiming Dong, Xing Mei, Chongyang Ma, Tong-Yee Lee, **Siwei Lyu**, Feiyue Huang, and Xiaopeng Zhang. Measuring and predicting visual importance of similar objects. *IEEE Transactions on Visualization and Computer Graphics*, 22(12):2564 – 2578, 2016. (impact factor: 3.078).
- J11. [PAMI16] . (impact factor: 17.730).
- J10. [PR15] Baoyuan Wu, **Siwei Lyu**, Baogang Hu, and Qiang Ji. Multi-label learning with missing labels for image annotation and facial action unit recognition. *Pattern Recognition*, 48(7):2279–2289, 2015. (impact factor: 3.962).
- J9. [IJCV14] **Siwei Lyu**, Xunyu Pan, and Xing Zhang. Exposing region splicing forgeries with blind local noise estimation. *International Journal of Computer Vision*, 110(2):202–221, November 2014. (impact factor: 11.541).
- J8. [NC11] **Siwei Lyu**. Divisive normalization as an efficient coding transform: Justification and effectiveness. *Neural Computation*, 23(11):2942–2973, November 2011. (impact factor: 1.651).
- J7. [TIFS10] Xunyu Pan and **Siwei Lyu**. Region duplication detection using image feature matching. *IEEE Transactions on Information Forensics and Security*, 5(4):857–867, December 2010. (impact factor: 5.824).
- J6. [NC09] **Siwei Lyu** and Eero P. Simoncelli. Nonlinear extraction of ‘independent components’ of natural images using radial Gaussianization. *Neural Computation*, 18(6):1–35, June 2009, **Featured on the cover page**. (impact factor: 1.651).
- J5. [PAMI08] . (impact factor: 9.455).
- J4. [TIFS06] **Siwei Lyu** and Hany Farid. Steganalysis using higher-order image statistics. *IEEE Transactions on Information Forensics and Security*, 1(1):111–119, January 2006, **IEEE Signal Processing Society Best Paper Award**. (impact factor: 5.824).
- J3. [IFAR06] Dan Rockmore, **Siwei Lyu**, and Hany Farid. A digital technique for authentication in the arts. *International Foundation for Art Research (IFAR) Journal*, 8(2):21–29, 2006. (invited feature article).
- J2. [TSP05] **Siwei Lyu** and Hany Farid. How realistic is photorealistic? *IEEE Transactions on Signal Processing*, 53(2):845–850, February 2005. (impact factor: 2.628).
- J1. [PNAS04] **Siwei Lyu**, Dan Rockmore, and Hany Farid. A digital technique for art authentication. *Proceedings of the National Academy of Sciences*, 101(49):17006–17010, November 2004. (impact factor: 9.504).

Prestigious Conference Papers

- C120. [CVPR21] Longyin Wen, Dawei Du, Pengfei Zhu, Qinghua Hu, Qilong Wang, Liefeng Bo, and **Siwei Lyu**. Detection, Tracking, and Counting Meets Drones in Crowds: A Benchmark. In *IEEE Conference on Computer Vision and Patten Recognition (CVPR)*, Nashville, Tennessee, USA, 2021. (Acceptance rate 1,593 out of 7,500 (21.2%) submissions).

- C119. [AISTATS21] Zhenhuan Yang, Yunwen Lei, **Siwei Lyu**, and Yiming Ying. Stability and differential privacy of stochastic gradient descent for pairwise learning with non-smooth loss. In *The 24th International Conference on Artificial Intelligence and Statistics (AISTATS)*, 2021. (Acceptance rate 455 out of 1,527 (29.8%) submissions).
- C118. [NeurIPS20] Shu Hu, Yiming Ying, Xin Wang, and **Siwei Lyu**. Learning by minimizing the sum of ranked range. In *Advances in Neural Information Processing Systems (NeurIPS)*, Montreal, QC, Canada, 2020. (Acceptance rate 1,900 out of 9,454 (20.1%) submissions).
- C117. [ACCV20] Yi Wei, Pengchuan Zhang, Wenbo Li, Zhe Gan, **Siwei Lyu**, Ming-Ching Chang, Lei Zhang, and Jianfeng Gao. MagGAN: High-Resolution Face Attribute Editing with Mask-Guided Generative Adversarial Network. In *Asian Conference on Computer Vision (ACCV)*, Kyoto, Japan, 2020. (Acceptance rate).
- C116. [MM20] Yunqiang Cai, Dawei Du, Libo Zhang, Longyin Wen, Weiqiang Wang, Yanjun Wu, and **Siwei Lyu**. Guided attention network for object detection and counting on drones. In *ACM Multimedia*, Seattle, WA, United States, October 2020. (Acceptance rate 472 out of 1,698 (27.8%) submissions).
- C115. [ECCV20a] Ao Luo, Xin Li, Fan Yang, Zhicheng Jiao, Hong Cheng, and **Siwei Lyu**. Cascade Graph Neural Networks for RGB-D Salient Object Detection. In *European Conference on Computer Vision (ECCV)*, Glasgow, UK, 2020. (Acceptance rate 1,361 out of 5,025 (27%) submissions).
- C114. [ECCV20b] Ruyi Ji, Dawei Du, Libo Zhang, Longyin Wen, Zhao Chen, Yanjun Wu, Feiyue Huang, and **Siwei Lyu**. Learning semantic neural tree for human parsing. In *European Conference on Computer Vision (ECCV)*, Glasgow, UK, 2020. (Acceptance rate 1,361 out of 5,025 (27%) submissions).
- C113. [CVPR20] Yuezun Li, Pu Sun, Honggang Qi, and **Siwei Lyu**. Celeb-DF: A Large-scale Challenging Dataset for DeepFake Forensics. In *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, Seattle, WA, United States, 2020. (Acceptance rate 1,470 out of 6,656 (22%) submissions).
- C112. [AAAI20] Wenbo Li, Yi Wei, Ming-Ching Chang, and **Siwei Lyu**. 3D Single-Person Concurrent Activity Detection Using Stacked Relation Network. In *34th AAAI Conference on Artificial Intelligence (AAAI-20)*, New York, NY, United States, 2020. (Acceptance rate 1,591 out of 7,737 (20.6%) submissions).
- C111. [BMVC19] Yuezun Li, Ming-Ching Chang, Xiao Bian, and **Siwei Lyu**. Exploring the vulnerability of single shot module in object detectors via imperceptible background patches. In *British Machine Vision Conference (BMVC)*, Cadiff, UK, 2019.
- C110. [MM19] Congcong Li, Dawei Du, Libo Zhang, Tiejian Luo, Yanjun Wu, Qi Tian, Longyin Wen, and **Siwei Lyu**. Data priming network for automatic check-out. In *ACM Multimedia*, Nice, France, 2019. (Acceptance rate 248 out of 936 (26.5%) submissions).
- C109. [MICCAI19] Bin Kong, Xin Wang, Junping Du, Yi Lu, Kunlin Cao, Qi Song, Shaoting Zhang, **Siwei Lyu**, and Youbing Yin. A multi-modal network for cardiomyopathy death risk prediction with CMR images and clinical information. In *the 22nd International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI)*, Shenzhen, China, 2019.
- C108. [IJCAI19] Zhe Xue, Junping Du, Dawei Du, Wenqi Ren, and **Siwei Lyu**. Deep correlated predictive subspace learning for incomplete multi-view semi-supervised classification. In *International Joint Conference on Artificial Intelligence (IJCAI)*, Macau, China, 2019. (Acceptance rate 850 out of 4350 (19.5%) submissions).
- C107. [CVPR19] Wenbo Li, Pengchuan Zhang, Lei Zhang, Qiuyuan Huang, **Siwei Lyu**, and Jianfeng Gao. Object-driven text-to-image synthesis via adversarial training. In *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, Long Beach, CA, United States, 2019. (Acceptance rate 25.2% of 5165 submissions).
- C106. [AAAI19a] Longyin Wen, Dawei Du, Shengkun Li, Xiao Bian, and **Siwei Lyu**. Learning Non-Uniform Hypergraph for Multi-Object Tracking. In *33rd AAAI Conference on Artificial Intelligence (AAAI-19)*, Honolulu, HI, United States, 2019. (Acceptance rate 16% of 7,500 submissions).

- C105. [AAAI19b] Dan Liu, Dawei Du, Libo Zhang, Tiejian Luo, Yanjun Wu, Feiyue Huang, and **Siwei Lyu**. Scale Invariant Fully Convolutional Network: Detecting Hands Efficiently. In *33rd AAAI Conference on Artificial Intelligence (AAAI-19)*, Honolulu, HI, United States, 2019. (Acceptance rate 16% of 7,500 submissions).
- C104. [ACCV18] Wenbo Li, Longyin Wen, Xiao Bian, and **Siwei Lyu**. Evolvement constrained adversarial learning for video style transfer. In *Asian Conference on Computer Vision (ACCV)*, Perth, Australia, 2018. (Acceptance rate 31% of 600).
- C103. [ECCV18] Lipeng Ke, Ming-Ching Chang, Honggang Qi, and **Siwei Lyu**. Multi-scale structure-aware network for human pose estimation. In *European Conference on Computer Vision (ECCV)*, Munich, Germany, 2018. (Acceptance rate 31% of 3,700).
- C102. [BMVC18] Yuezun Li, Daniel Tian, Ming-Ching Chang, Xiao Bian, and **Siwei Lyu**. Universal adversarial perturbation on deep proposal-based models. In *British Machine Vision Conference (BMVC)*, Bristol, United Kingdom, 2018. (Acceptance rate 23% of 1,120).
- C101. [IROS18] Shuai Li, **Siwei Lyu**, and Jeff Trinkle. Efficient state estimation with constrained Rao-Blackwellized particle filter. In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Madrid, Spain, 2018. (Acceptance rate 47% of 2,693 submissions).
- C100. [UAI18] **Siwei Lyu** and Yiming Ying. A univariate bound of area under ROC. In *The International Conference on Uncertainty in Artificial Intelligence (UAI)*, Monterey, CA, United States, 2018. (Acceptance rate 30% of 337 submissions).
- C99. [ICML18] Yiming Ying, Micheal Natole, and **Siwei Lyu**. Stochastic proximal algorithms for AUC maximization. In *International Conference on Machine Learning (ICML)*, Stockholm, Sweden, 2018. (Acceptance rate 25% of 2473 submissions).
- C98. [CVPR18] Baoyuan Wu, Bernard S. Ghanem, Wei Liu, and **Siwei Lyu**. Tagging like humans: Diverse and distinct image annotation. In *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, Salt Lake City, UT, United States, 2018. (Acceptance rate 24% of 5687 submissions).
- C97. [NIPS17] Yanbo Fan, **Siwei Lyu**, Yiming Ying, and Baogang Hu. Learning with average top-k loss. In *Advances in Neural Information Processing Systems (NIPS)*, Long Beach, CA, United States, 2017. (Acceptance rate 21% of 3240 submissions).
- C96. [ICCV17] Wenbo Li, Longyin Wen, Ming-Ching Chang, Ser nam Lim, and **Siwei Lyu**. Adaptive RNN tree for large-scale human action recognition. In *IEEE International Conference on Computer Vision (ICCV)*, Venice, Italy, 2017.
- C95. [AAAI17] Yang Yang, Longyin Wen, **Siwei Lyu**, and Stan Z. Li. Learning multi-level descriptors for person re-identification. In *31st AAAI Conference on Artificial Intelligence (AAAI-17)*, San Francisco, CA, United States, 2017. (Acceptance rate 26% of 2132 submissions).
- C94. [NIPS16] Yiming Ying, Longyin Wen, and **Siwei Lyu**. Stochastic online auc maximization. In *Advances in Neural Information Processing Systems (NIPS)*, Barcelona, Spain, December 2016. (**Oral**, Acceptance rate 1.8% of 2500 submissions).
- C93. [AISTATS16] Martin Boissier, Yiming Ying, **Siwei Lyu**, and Dingxuan Zhou. Fast convergence of online pairwise learning algorithms. In *The 19th International Conference on Artificial Intelligence and Statistics (AISTATS)*, Cadiz, Spain, 2016 (Acceptance rate 31% of 537 submissions).
- C92. [AAAI16a] Baoyuan Wu, **Siwei Lyu**, and Bernard S. Ghanem. Multi-label learning to missing labels and class imbalance. In *30th AAAI Conference on Artificial Intelligence (AAAI-16)*, Phoenix, AZ, United States, 2016 (Acceptance rate 26% of 2132 submissions).
- C91. [AAAI16b] Xin Wang, Yiming Ying, Ming-Ching Chang, and **Siwei Lyu**. Co-regularized PLSA for multi-modal learning. In *30th AAAI Conference on Artificial Intelligence (AAAI-16)*, Phoenix, AZ, United States, 2016 (Acceptance rate 26% of 2132 submissions).
- C90. [ICCV15a] Wenbo Li, Longyin Wen, Mooi Choo Chua, and **Siwei Lyu**. Category-blind human action recognition: A practical recognition system. In *IEEE International Conference on Computer Vision (ICCV)*, Santiago, Chile, 2015 (Acceptance rate 30% of 1698 submissions).

- C89. [ICCV15b] Baoyuan Wu, **Siwei Lyu**, and Bernard S. Ghanem. Machine Learning-MG: Multi-label learning with missing labels using a mixed graph. In *IEEE International Conference on Computer Vision (ICCV)*, Santiago, Chile, 2015 (Acceptance rate 30% of 1698 submissions).
- C88. [ICCV15c] Xing Mei, Honggang Qi, Baogang Hu, and **Siwei Lyu**. Improving image restoration with soft-rounding. In *IEEE International Conference on Computer Vision (ICCV)*, Santiago, Chile, 2015 (Acceptance rate 30% of 1698 submissions).
- C87. [CVPR15] Xing Mei, Weiming Dong, Baogang Hu, and **Siwei Lyu**. UniHIST: A unified framework for image restoration with histogram. In *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, Boston, MA, United States, 2015. (Acceptance rate 30% of 2400 submissions).
- C86. [BMVC15] Ming-Ching Chang, Honggang Qi, Xin Wang, Hong Cheng, and **Siwei Lyu**. Fast online upper body pose estimation from video. In *British Machine Vision Conference (BMVC)*, Swansea, United Kingdom, 2015 (Acceptance rate 33% of 553 submissions).
- C85. [IROS15] Shuai Li, **Siwei Lyu**, Jeff Trinkle, and Wolfart Burgard. An evaluation of particle filters for contact-slam problems. In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Hamburg, Germany, 2015 (Acceptance rate 46% of 2134 submissions).
- C84. [FG15] Yelin Kim, Jixu Chen, Ming-Ching Chang, Xin Wang, Emily M. Provost, and **Siwei Lyu**. Joint event localization and classification of human action videos with event transitions. In *IEEE International Conference on Automatic Face and Gesture Recognition (FG)*, Ljubljana, Slovenia, 2015. (**Oral**, Acceptance rate 12% of 221 submissions)
- C83. [ICRA15] Shuai Li, **Siwei Lyu**, and Jeff Trinkle. State estimation for dynamic systems with intermittent contact. In *IEEE Conference on Robotics and Automation (ICRA)*, Seattle, WA, United States, 2015. (**Oral**, Acceptance rate 41% of 2275 submissions)
- C82. [ICANN14] Xing Zhang and **Siwei Lyu**. Variational EM learning of deep stack Boltzmann networks with deep boltzmann machines. In *International Conference on Artificial Neural Networks (ICANN)*, Hamburg, Germany, 2014.
- C81. [CVPR14] Xing Zhang and **Siwei Lyu**. Using projection kurtosis concentration of natural images for blind noise covariance matrix estimation. In *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, Columbus, OH, United States, 2014. (Acceptance rate 30% of 1807 submissions)
- C80. [NIPS13] **Siwei Lyu** and Xin Wang. On algorithms of sparse multi-factor nonnegative matrix factorization. In *Advances in Neural Information Processing Systems (NIPS)*, South Lake Tahoe, CA, United States, 2013. (Acceptance rate 25% of 1420 submissions)
- C79. [ICCV13] Baoyuan Wu, **Siwei Lyu**, Baogang Hu, and Qiang Ji. Simultaneous clustering and tracklet linking for multi-face tracking in videos. In *IEEE International Conference on Computer Vision (ICCV)*, Sydney, Australia, 2013. (Acceptance rate 29% of 1505 submissions)
- C78. [IJCAI13] Zuoguan Wang, **Siwei Lyu**, and Qiang Ji. Deep feature learning using target priors with applications in ECoG signal decoding for BCI. In *International Joint Conference on Artificial Intelligence (IJCAI)*, Beijing, China, August 2013. (**Oral**, Acceptance rate 28% of 1473 submissions)
- C77. [ICRA13] Li Zhang, **Siwei Lyu**, and Jeff Trinkle. A dynamic Bayesian approach to simultaneous estimation and filtering in grasp acquisition. In *IEEE Conference on Robotics and Automation (ICRA)*, Karlsruhe, Germany, 2013. (**Oral**, Acceptance rate 39% of 2265 submissions)
- C76. [ACCV12] Jixu Chen, Xiaoming Liu, and **Siwei Lyu**. Boosting with side information. In *Asian Conference on Computer Vision (ACCV)*, Daegu, South Korea, 2012. (Acceptance rate 27%)
- C75. [NIPS12] Zuoguan Wang, **Siwei Lyu**, G. Schalk, K. Miller, and Qiang Ji. Learning with target priors. In *Advances in Neural Information Processing Systems (NIPS)*, South Lake Tahoe, CA, United States, 2012. (Acceptance rate 24% of 1467 submissions)
- C74. [ICCP12] Xunyu Pan, Xing Zhang, and **Siwei Lyu**. Exposing image splicing with inconsistent local noise variances. In *IEEE International Conference on Computational Photography*, Seattle, WA, United States, 2012. (Acceptance rate 20% of 120 submissions)

- C73. [NIPS11] **Siwei Lyu**. Unifying non-maximum likelihood learning objectives with minimum KL contraction. In *Advances in Neural Information Processing Systems (NIPS)*, Granada, Spain, 2011. (Acceptance rate 22% of 1400 submissions)
- C72. [NIPS10] **Siwei Lyu**. Divisive normalization: Justification and effectiveness as efficient coding transform. In *Advances in Neural Information Processing Systems (NIPS)*, Vancouver, Canada, 2010. (Acceptance rate 24% of 1219 submissions)
- C71. [UAI09] **Siwei Lyu**. Interpretation and generalization of score matching. In *The International Conference on Uncertainty in Artificial Intelligence (UAI)*, Montreal, QC, Canada, June 2009. (**Oral**, Acceptance rate 12%)
- C70. [CVPR09] **Siwei Lyu**. An implicit Markov random field model for natural images in multi-scale oriented representations. In *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, Miami Beach, FL, United States, June 2009. (Acceptance rate 26% of 1464 submissions)
- C69. [NIPS08] **Siwei Lyu** and Eero P. Simoncelli. Reducing statistical dependencies in natural signals using radial Gaussianization. In *Advances in Neural Information Processing Systems (NIPS)*, Vancouver, Canada, 2008. (**Oral**, Acceptance rate 2.7% of 1022 submissions)
- C68. [CVPR08] **Siwei Lyu** and Eero P. Simoncelli. Nonlinear image representation using divisive normalization. In *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, Anchorage, AK, United States, June 2008. (Acceptance rate 24% of 1593 submissions)
- C67. [NIPS06] **Siwei Lyu** and Eero P. Simoncelli. Statistical modeling of images with fields of Gaussian scale mixtures. In *Advances in Neural Information Processing Systems (NIPS)*, Vancouver, Canada, 2006. (Acceptance rate 26%)
- C66. [ECML05] **Siwei Lyu**. Kernels for unordered sets: the Gaussian mixture approach. In *European Conference on Machine Learning (ECML)*, Porto, Portugal, 2005. (**Oral**, Acceptance rate 10%)
- C65. [CVPR05a] **Siwei Lyu**. Mercer kernels for object recognition with local features. In *IEEE International Conference on Computer Vision and Pattern Recognition (CVPR)*, San Diego, CA, United States, 2005. (Acceptance rate 26%)
- C64. [CVPR05b] **Siwei Lyu**. Infomax boosting. In *IEEE International Conference on Computer Vision and Pattern Recognition (CVPR)*, San Diego, CA, United States, 2005. (Acceptance rate 26%)
- C63. [MM05] **Siwei Lyu**. Automatic image orientation determination with natural image statistics. In *ACM Multimedia*, Singapore, 2005. (Acceptance rate 32%)
- C62. [IH02] **Siwei Lyu** and Hany Farid. Detecting hidden messages using higher-order statistics and support vector machines. In *International Workshop on Information Hiding*, Noordwijkerhout, Netherlands, 2002. (Acceptance rate 24%)

Other Conference/Workshop Papers

- C61. [SADFE21] Yuezun Li, Cong Zhang, Pu Sun, Honggang Qi, and **Siwei Lyu**. Deepfake-o-meter: An open platform for deepfake detection. In *International Conference on Systematic Approaches to Digital Forensic Engineering (SADFE)*, 2021.
- C60. [ICME21] Quanyu Liao, Xin Wang, Bin Kong, **Siwei Lyu**, Bin Zhu, Youbing Yin, Qi Song, and Xi Wu. Transferable adversarial examples for anchor free object detection. In *IEEE International Conference on Multimedia and Expo (ICME)*, Shenzhen, China, 2021 (Acceptance rate 30% of 1,700 submissions).
- C59. [ICASSP21] Shu Hu, Yuezun Li, and **Siwei Lyu**. Exposing GAN-generated faces using inconsistent corneal specular highlights. In *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, Toronto, Canada, 2021.
- C58. [WIFS20] Pu Sun, Yuezun Li, Honggang Qi, and **Siwei Lyu**. Landmark breaker: Obstructing deepfake by disturbing landmark extraction. In *IEEE Workshop on Information Forensics and Security (WIFS)*, New York, NY, United States, 2020.

- C57. [INTERSPEECH20] Ehab AlBadawy and **Siwei Lyu**. Voice conversion using speech-to-speech neuro-style transfer. In *Interspeech*, Shanghai, China, October 2020 (Acceptance rate 47%).
- C56. [IROS20] Yi Wei, Wenbo Li, Ming-Ching Chang, Hongxia Jin, and **Siwei Lyu**. Explainable and efficient sequential correlation network for 3D single person concurrent activity detection. In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Las Vegas, NV, United States, 2020.
- C55. [ICIP20] Yuezun Li, Ao Luo, and **Siwei Lyu**. Fast portrait segmentation with highly light-weight network. In *IEEE Conference on Image Processing (ICIP)*, Dubai, UAE, 2020.
- C54. [ICMEW20] **Siwei Lyu**. DeepFake detection: Current challenges and next steps. In *International Workshop on Media-Rich Fake News (MedFake) in conjunction with ICME*, London, UK, 2020.
- C53. [IJCNN20] Quanyu Liao, Xin Wang, Bin Kong, **Siwei Lyu**, Youbing Yin, Qi Song, and Xi Wu. Fast local attack: Generating local adversarial examples for object detectors. In *International Joint Conference on Neural Networks (IJCNN)*, Glasgow, UK, 2020.
- C52. [AVSS19] Yuezun Li, Longyin Wen, Ming-Ching Chang, and **Siwei Lyu**. Graph-to-graph energy minimization for video object segmentation. In *International Conference on Advanced Video and Signal-Based Surveillance (AVSS)*, Taipei, Taiwan, 2019.
- C51. [CVPRW19a] Ehab AlBadawy, **Siwei Lyu**, and Hany Farid. Detecting ai-synthesized speech using bispectral analysis. In *Workshop on Media Forensics (in conjunction with CVPR)*, Long Beach, CA, United States, 2019.
- C50. [CVPRW19b] Yuezun Li and **Siwei Lyu**. Exposing deepfake videos by detecting face warping artifacts. In *Workshop on Media Forensics (in conjunction with CVPR)*, Long Beach, CA, United States, 2019.
- C49. [IHMMSec19a] Xin Yang, Yuezun Li, Honggang Qi, and **Siwei Lyu**. Exposing GAN-synthesized faces using landmark locations. In *International Workshop on Information Hiding and Multimedia Security*, Paris, France, 2019 (Acceptance rate 37% of 62 submissions).
- C48. [IHMMSec19b] Yuezun Li and **Siwei Lyu**. De-identification without losing faces. In *International Workshop on Information Hiding and Multimedia Security*, Paris, France, 2019 (Acceptance rate 37% of 62 submissions).
- C47. [ICASSP19b] Shuchen Weng, Wenbo Li, Yi Zhang, and **Siwei Lyu**. Dual-stream cnn for structured time series classification. In *IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, Bristol, United Kingdom, 2019 (Acceptance rate 46.5%).
- C46. [ICASSP19a] Xin Yang, Yuezun Li, and **Siwei Lyu**. Exposing deep fakes using inconsistent head poses. In *IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, Bristol, United Kingdom, 2019 (Acceptance rate 46.5%).
- C45. [ISBI19] Eric Wu, Bin Kong, Xin Wang, Junjie Bai, Yi Lu, Feng Gao, Shaoting Zhang, Kunlin Cao, Qi Song, **Siwei Lyu**, and Youbing Yin. Residual attention based network for hand bone age assessment. In *IEEE International Symposium on Biomedical Imaging (ISBI)*, Venice, Italy, 2019.
- C44. [AVSS18] Yuezun Li, Xiao Bian, Ming-Ching Chang, and **Siwei Lyu**. Pixel offset regression (POR) for single-shot instance segmentation. In *International Conference on Advanced Video and Signal-Based Surveillance (AVSS)*, Auckland, New Zealand, November 2018.
- C43. [WIFS18] Yuezun Li, Ming-Ching Chang, and **Siwei Lyu**. In Ictu Oculi: Exposing AI Created Fake Videos by Detecting Eye Blinking. In *IEEE Workshop on Information Forensics and Security (WIFS)*, Hong Kong, December 2018 (Acceptance rate 32% of 105 submissions).
- C42. [ICIP18] Lipeng Ke, Ming-Ching Chang, Honggang Qi, and **Siwei Lyu**. Multi-scale supervised network for human pose estimation. In *IEEE Conference on Image Processing (ICIP)*, Athens, Greece, 2018.
- C41. [AIC18a] Milind Naphade, et.al., and **Siwei Lyu**. The 2018 NVIDIA AI City Challenge. In *IEEE Workshop on AI City Challenge (in conjunction with CVPR)*, Salt Lake City, UT, United States, 2018.
- C40. [AIC18b] Ming-Ching Chang, Yi Wei, Nenghui Song, and **Siwei Lyu**. Video analytics in smart transportation for the AIC'18 challenge. In *IEEE Workshop on AI City Challenge (in conjunction with CVPR)*, Salt Lake City, UT, United States, 2018.

- C39. [ICPR18b] Yi Wei, Ming-Ching Chang, Yiming Ying, Ser Nam Lim, and **Siwei Lyu**. Explain black-box image classifications using superpixel-based interpretation. In *International Conference on Pattern Recognition (ICPR)*, Beijing, China, 2018.
- C38. [ICPR18a] Cong Zhang, Dawei Du, Lipeng Ke, Honggang Qi, and **Siwei Lyu**. Global contrast enhancement detection via deep multi-path network. In *International Conference on Pattern Recognition (ICPR)*, Beijing, China, 2018.
- C37. [AVSS17] **Siwei Lyu** and et.al. AVSS 2017 challenge on advanced traffic monitoring. In *International Conference on Advanced Video and Signal-Based Surveillance (AVSS)*, Lecce, Italy, 2017.
- C36. [AIC17b] Ming-Ching Chang, Yi Wei, Nenghui Song, Lipeng Ke, and **Siwei Lyu**. Traffic analysis based on object detection and vehicle tracking. In *2017 IEEE AI City Challenge*, San Jose, CA, United States, 2017. IEEE.
- C35. [AIC17a] Milind Naphade, David C. Anastasiu, Anuj Sharma, Vamsi Jagrlamudi, Hyeron Jeon, Kaikai Liu, Ming-Ching Chang, **Siwei Lyu**, and Zeyu Gao. The NVIDIA AI City Challenge. In *2017 IEEE SmartWorld, Ubiquitous Intelligence & Computing, Advanced & Trusted Computed, Scalable Computing & Communications, Cloud & Big Data Computing, Internet of People and Smart City Innovation (Smart-World/SCALCOM/UIC/ATC/CBDCOM/IOP/SCI)*, SmartWorld'17, San Jose, NJ, United States, United States, 2017. IEEE.
- C34. [VOT17] (as participating team). The visual object tracking VOT2017 challenge results. In *ICCV Workshop on Visual Object Tracking Challenge*, Venice, Italy, 2017.
- C33. [ICIP17] Shengkun Li, Dawei Du, Longyin Wen, Ming-Ching Chang, and **Siwei Lyu**. Hybrid structure hypergraph for online deformable object tracking. In *IEEE Conference on Image Processing (ICIP)*, Beijing, China, 2017.
- C32. [IJCNN17] Andrew Pulver and **Siwei Lyu**. LSTM with working memory. In *International Joint Conference on Neural Networks (IJCNN)*, Anchorage, AK, United States, 2017.
- C31. [HUMANOID16] Shuai Li, **Siwei Lyu**, and Jeff Trinkle. Contact aware robotics manipulation. In *Work Shop on Tactile Sensing for Manipulation: New progress and Challenges (in conjunction with IEEE RAS-Humanoids)*, Cancun, Mexico, 2016.
- C30. [WIFS16] Honggang Qi, Andrew Pulver, and **Siwei Lyu**. Using 3D face model for forensic analysis of lighting environment. In *IEEE Workshop on Information Forensics and Security (WIFS)*, Abu Dhabi, United Arab Emirates, 2016 (Acceptance rate 32% out of 108 submissions).
- C29. [AVSS16] Yueming Yang, Ming-Ching Chang, Longyin Wen, Peter Tu, Honggang Qi, and **Siwei Lyu**. Efficient large-scale photometric reconstruction using divide-recon-fuse 3D structure from motion. In *International Conference on Advanced Video and Signal-Based Surveillance (AVSS)*, Colorado Springs, CO, United States, 2016.
- C28. [OPT15] Martin Boissier, Yiming Ying, **Siwei Lyu**, and Dingxuan Zhou. Fast convergence of online pairwise learning algorithms. In *NIPS Workshop on Optimization for Machine Learning*, Montreal, QC, Canada, 2015.
- C27. [VOTIR15] (as participating team). The visual object tracking VOTITR2015 challenge results. In *ICCV Workshop on Visual Object Tracking Challenge*, Santiago, Chile, 2015.
- C26. [VOT15] (as participating team). The visual object tracking VOT2015 challenge results. In *ICCV Workshop on Visual Object Tracking Challenge*, Santiago, Chile, 2015.
- C25. [ICIP15] Yueming Yang, Ming-Ching Chang, and **Siwei Lyu**. Seeing as it happens: Real time 3d video event visualization. In *IEEE Conference on Image Processing (ICIP)*, Quebec, Canada, 2015.
- C24. [ASIA15] Andrew Pulver, Ming-Ching Chang, and **Siwei Lyu**. Shot segmentation and grouping for ptz camera videos. In *Annual Symposium on Information Assurance (ASIA)*, Albany, NY, United States, 2015.
- C23. [SPIE15] Amanda Danko and **Siwei Lyu**. Fused methods for visual saliency estimation. In *SPIE Symposium on Electronic Imaging*, San Jose, CA, United States, 2015.

- C22. [ICCE15] Amanda Danko and **Siwei Lyu**. Better together: Fusing visual saliency methods for retrieving perceptually similar images. In *IEEE Conference on Consumer Electronics (ICCE)*, Las Vegas, NV, United States, 2015.
- C21. [RSSW14] Shuai Li, **Siwei Lyu**, Jeff Trinkle, and Wolfart Burgard. An evaluation of particle filters for contact-SLAM problems. In *RSS Workshop on Information-based Grasp and Manipulation Planning*, Berkeley, CA, United States, 2014.
- C20. [ICIP14a] Xing Mei, Baogang Hu, and **Siwei Lyu**. Non-blind image restoration with symmetric generalized Pareto priors. In *IEEE Conference on Image Processing (ICIP)*, Paris, France, 2014.
- C19. [ICIP14b] Xing Zhang and **Siwei Lyu**. Blind estimation of pixel brightness transform. In *IEEE Conference on Image Processing (ICIP)*, Paris, France, 2014.
- C18. [MANDM14a] Eric Lifshin, **Siwei Lyu**, Yudal P. Kandel, and Richard L. Moore. The use of regularized least squares minimization for the deconvolution of SEM images. In *Microscopy & Microanalysis*, Hartford, CT, United States, 2014.
- C17. [MANDM14b] Eric Lifshin, Yudal P. Kandel, Richard L. Moore, and **Siwei Lyu**. Improved SEM image resolution through the use of image restoration techniques. In *Microscopy & Microanalysis*, Hartford, CT, United States, 2014. (invited paper).
- C16. [ICLS14] Weiyi Sun, Jianwei Zhang, Hui Jin, and **Siwei Lyu**. Analyzing online knowledge building discourse using probabilistic topic models. In *International Conference of the Learning Sciences (ICLS)*, Boulder, CO, United States, 2014. (Acceptance rate 30% of 749 submissions).
- C15. [NIPSW13] Weiyi Sun, Jianwei Zhang, Hui Jin, and **Siwei Lyu**. Probabilistic topic analysis of online knowledge building discourse. In *NIPS Workshop on Data Driven Education*, South Lake Tahoe, CA, United States, 2013.
- C14. [CHINASIP13a] **Siwei Lyu**. An upper-bound on second-order dependency. In *IEEE International Conference and China Forum on Signal and Information Processing (ChinaSIP)*, Beijing, China, July 2013.
- C13. [CHINASIP13b] **Siwei Lyu**. Bayesian supervised learning with non-Gaussian latent variables. In *IEEE International Conference and China Forum on Signal and Information Processing (ChinaSIP)*, Beijing, China, July 2013.
- C12. [ICASSP12] Xunyu Pan, Xing Zhang, and **Siwei Lyu**. Detecting splicing in digital audios using local noise level estimation. In *IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, Kyoto, Japan, 2012.
- C11. [SPIE12] Xunyu Pan, Xing Zhang, and **Siwei Lyu**. Blind local noise estimation for medical images reconstructed from rapid acquisition. In *SPIE Symposium on Medical Imaging*, San Diego, CA, United States, 2012.
- C10. [MMSEC11] Xunyu Pan, Xing Zhang, and **Siwei Lyu**. Exposing image forgery with blind noise estimation. In *ACM Workshop on Multimedia and Security (MM&Sec)*, Niagara Falls, NY, United States, 2011.
- C9. [MMSEC10] **Siwei Lyu**. Estimating vignetting function from a single image for image authentication. In *ACM Workshop on Multimedia and Security (MM&Sec)*, Rome, Italy, 2010.
- C8. [ICIP10] **Siwei Lyu**. Single image vignetting correction with natural image statistics in derivative domains. In *IEEE Conference on Image Processing (ICIP)*, Hong Kong, September 2010.
- C7. [ICASSP10b] Xunyu Pan and **Siwei Lyu**. Detecting image region duplication using SIFT features. In *IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, Dallas, United States, United States, 2010.
- C6. [ICASSP10a] **Siwei Lyu**. Nonnegative matrix factorization with matrix exponentiation. In *IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, Dallas, United States, United States, 2010.
- C5. [SPIE07] **Siwei Lyu** and Eero P. Simoncelli. Statistically and perceptually motivated nonlinear image representation. In *IS&T/SPIE 19th Annual Symposium of Electronic Imaging*, San Jose, CA, United States, 2007 (invited paper).

- C4. [ARTMATH05] **Siwei Lyu**, Dan Rockmore, and Hany Farid. Wavelet analysis for art authentication. In *Art+Math=X*, Boulder, CO, United States, 2005.
- C3. [SPIE05] Micah Kimo Johnson, **Siwei Lyu**, and Hany Farid. Steganalysis of recorded speech. In *SPIE Symposium on Electronic Imaging*, San Jose, CA, United States, 2005.
- C2. [SPIE04] **Siwei Lyu** and Hany Farid. Steganalysis using color wavelet statistics and one-class support vector machines. In *SPIE Symposium on Electronic Imaging*, San Jose, CA, United States, 2004.
- C1. [CVPRW03] Hany Farid and **Siwei Lyu**. Higher-order wavelet statistics and their application to digital forensics. In *CVPR Workshop on Statistical Analysis in Computer Vision*, Madison, Wisconsin, United States, 2003.

INVITED TALKS

- 2020 *Fighting AI Synthesized Fake Media*, Great Lake Security Day, November 05.
- 2019 *DeepFake the Menace*, University of Buffalo, CSE Department, November 05.
- 2018 *Seeing Is Deceiving: Fighting Fake Media with Algorithms*, Computer Science Department, Yale University, New Haven, CT, November 13.
- 2018 *DeepFake the Menace*, MIT/Harvard AI Research Center, MIT, Boston, MA, September 9.
- 2018 *Digital Media Forensics*, Institute of Computer Science and Technology, Peking University, Beijing, China, July 16.
- 2018 *Detecting DeepFake Videos*, Fake News Horror Show, New York City Media Center, New York, NY, June 6.
- 2017 *The UA-DETRACT Challenge*, IEEE AVSS IS4T Workshop, Lecce, Italy, August 29.
- 2016 *Multi-Object Tracking with Hyper-graphs*, Shenyang Institute of Automation, Chinese Academy of Sciences, Shenyang, China, July 7.
- 2016 *Digital Media Forensics*, School of Computer Science, Tianjin University, Tianjin, China, June 16.
- 2016 *Image Restoration with Pixel Priors*, School of Computer and Information Science, Tianjin Normal University, Tianjin, China, June 5.
- 2016 *I Know What You Did in Your Last Photoshop Session: Digital Image Forensics*, Computer Science and Engineering Department, Michigan State University, East Lansing, MI, February 5.
- 2015 *Multi-Object Tracking with Hyper-graphs*, School of Automation, University of Electronic Science and Technology of China, Chengdu, China, July 14.
- 2014 *Digital Image Forensics*, Binhai College, Nankai University, Tianjin, China, December 14.
- 2014 *I Know What You Did in Your Last Photoshop Session: Digital Image Forensics*, Kitware Inc., Clifton Park, NY, October 12.
- 2013 *Detecting Region Splicing with Local Noise Estimation*, National Laboratory of Pattern Recognition, Beijing, China, July 3.
- 2013 *Detecting Region Splicing with Local Noise Estimation*, College of Information and Computation, Peking University, Beijing, China, June 28.
- 2013 *Detecting Region Splicing with Local Noise Estimation*, Computer Science Department, Nankai University, Tianjin, China, June 26.
- 2012 *Modeling Natural Image Statistics*, Munsell Color Science Laboratory, Rochester Institute of Technology, Rochester, NY, January 31.
- 2012 *Exposing Region Duplication with Image Feature Matching*, Computer Science Department, Union College, Schenectady, NY, January 15.
- 2011 *Unifying Non-Maximum Likelihood Learning Algorithms with KL Contraction*, Computer Science Department, Rensselaer Polytechnic Institute, Troy, NY, October 11.

- 2011 *Dependency Reduction in Natural Images with Divisive Normalization*, Redwood Center for Neural Sciences, UC Berkeley, January 29.
- 2009 *Radial Gaussianization and Natural Image Statistics*, IBM T.J. Watson Research Center, Hawthorn, NY, November 3.
- 2009 *Radial Gaussianization and Natural Image Statistics*, GE Global Research Center, Niskayuna, NY, October 16.
- 2009 *Modeling Natural Image Statistics*, Computer Science Department, Temple University, Philadelphia, PA, April 10.
- 2009 *Modeling Natural Image Statistics*, GRASP Lab, University of Pennsylvania, Philadelphia, PA, April 9.
- 2008 *Modeling Natural Image Statistics*, Electronic and Computer Engineering Department, Rensselaer Polytechnic Institute, Troy, NY, October 11.
- 2008 *Natural Image Statistics for Digital Image Forensics*, Google Research Lab, New York, NY, April 10.
- 2007 *Natural Image Statistics for Digital Image Forensics*, Computer Science Department, Brooklyn Polytechnic University (now NYU Tanden School of Engineering), November 15.
- 2007 *Divisive Normalization for Image Processing*, Computer Science Department, Columbia University, New York, NY, October 10.
- 2007 *Modeling Natural Image Statistics*, Siemens Corporate Research, Princeton, NJ, May 7.
- 2007 *Modeling Natural Image Statistics*, Computer Science Department, University at Albany, SUNY, April 30.
- 2007 *Modeling Natural Image Statistics*, Computer Science Department, Brown University, February 17.
- 2005 *Natural Image Statistics for Digital Image Forensics*, Center for Neural Sciences, New York University, New York, NY, February 7
- 2005 *Natural Image Statistics for Digital Image Forensics*, Computer Science and AI Lab, MIT, Boston, MA, January 18.

PROFESSIONAL SERVICE

- | | |
|----------------------|---|
| Professional Service | Associate Editor of Pattern Recognition (2020 -); Associate Editor of IEEE Transactions on Information Forensics and Security (2016-2020); Member of IEEE SPS Information Forensics and Security Technical Committee (2017-2020); Member of IEEE AVSS Steering Committee (2017 - 2020); Academic Advisor for FaceBook DeepFake Detection Challenge (2019-2020). |
| Conference Organizer | Sponsorship Chair, IEEE International Workshop on Information Forensics and Security (2020); Program Chair, International Conference on Information Hiding and Multimedia Security (2019); Publicity Chair, IEEE Conference on Advances in Video and Signal based Surveillance (2019); Publication Chair, IEEE NVIDIA Workshop AI City Challenge (2018); Advisory Committee, ECCV Workshop on UAV Surveillance (2018); Area Chair, IEEE International Conference on Image Processing (2017); Challenge Co-Chair, IEEE Conference on Advances in Video and Signal based Surveillance (2017). Co-Chair, special session on <i>Digital Media Forensics</i> in the First IEEE ChinaSIP Conference (2013). |
| Proposal Reviewer | Proposal review panelist for the National Science Foundation (2009, 2010, 2012, 2013, 2014, 2015); Proposal reviewer for The European Research Consortium for Informatics and Mathematics (2011). |

PROFESSIONAL MEMBERSHIPS

- IEEE Senior Member (2016 – present), Member (2005 – 2016), Student Member (2001 – 2005).
- ACM Member (2008 – present).
- Omicron Delta Kappa (*OΔK*) Member (2016 – present).
- Sigma Xi Member (2019 – present).

PATENTS

- C1. Method and System for Separating Text and Drawings in Digital Ink. U.S. Patent 7298903 (B2), 2007
- C2. Method and System for Representing and Displaying Digital Ink. U.S. Patent 7450125 (B2), 2008, U.S. Patent 7057615 (B2), 2006, and E.U. Patent EP1271407, 2003
- C3. Computer Readable Medium for Expressing and Displaying Digital Ink and Computer System. Japan Patent JP2003141100, 2005
- C4. Systems and Methods for Analyzing Time Series Data Based on Event Transitions. U.S. Patent 9984154, 2018.

COURSES TAUGHT

Undergraduate Courses

Introduction to Data Mining	Fall '08, '09, '10, '11
Introduction to Digital Image Forensics	Spring '09, '10, '11, '12, '13
Introduction to Computer Vision	Spring '10, Fall '10
Introduction to Data Analytics	Fall '12, '13, '14, '16
Introduction to Machine Learning	Fall '10, Spring '12, '14, '16, '17, '18, '19, '20
Ethics in Computing	Spring '20

Graduate Courses

Advanced Data Mining	Fall '08, '09, '10, '11
Advanced Digital Image Forensics	Spring '09, '10, '11, '12, '13, '14
Advanced Computer Vision	Spring '10,
Advanced Machine Learning	Fall '10, Spring '12, '14, '16, '17, '18, '19

ADVISEMENT

Post-doc Advisor

- Dr. Longyin Wen, Post-doc, 2015 – 2016
First job: Research Scientist, GE Global Research Center.
Current job: ByteDance, Inc.
- Dr. Xing Mei, Post-doc, 2013 – 2015
First job: SnapChat Inc.
Current job: ByteDance, Inc.
- Dr. Dawei Du, Post-doc, 2018 – 2020
First job: Kitware Inc.
- Dr. Feng Ding, Post-doc, 2019 – 2020
First job: Huazhong University of Science and Technology, Wuhan, China.

Primary Graduate Advisor

- Xunyu Pan, Ph.D. in Computer Science, SUNY Albany, 2011
Dissertation: *Local Statistical Features For Digital Image Forensics*
SUNY Albany **Distinguished Dissertation Award**, SUNY Albany, 2012
First job: Assistant Professor, Computer Science Department, Frostburg State University
Current job: tenured Associate Professor, Computer Science Department, Frostburg State University

- Xing Zhang, M.S. in Computer Science, SUNY Albany, 2012
First job: Novellus Inc.
- Jianting Wen, M.S. in Computer Science, SUNY Albany, 2012
First job: Facebook.
- Amanda Danko, Ph.D. in Computer Science, SUNY Albany, 2015
Dissertation: *Visual Saliency Estimation: A Cognitive Pre-Attentive and Context-Aware Approach*
SUNY Albany **Distinguished Dissertation Award**, 2015
First job: Research Scientist at USAA Research, San Antonio, TX.
Current job: Assistant Professor of Computer Science and Engineering at University of Texas, San Antonio, TX.
- Xin Wang, Ph.D. in Computer Science, SUNY Albany graduated November, 2015
Dissertation: *Topic Analysis And Application Using Nonnegative Matrix Factorizations (NMF)*
First job: Research Scientist CuraCloud Inc., Seattle, WA
- Yueming Yang, Ph.D. in Computer Science, SUNY Albany, 2015
Dissertation: *Efficient Large-Scale Photometric Reconstruction*
First job: Research Assistant Professor, College of Mount Holyoke
Current job: Assistant Professor, Baldwin Wallace University.
- Wenbo Li, Ph.D. in Computer Science, SUNY Albany, 2019
Dissertation: *Skeleton-based human activity recognition*
First job: Samsung Research USA
- Yuezun Li, Ph.D. in Computer Science, SUNY Albany, 2020
Dissertation: *Detection and counter-measures to AI-generated Fake Media*
First job: Post-doc, University at Buffalo, State University of New York.
- Shengkun Li, Ph.D. student in Computer Science, SUNY Albany.
- Lipeng Ke, Ph.D. student in Computer Science, SUNY Albany.
- Shu Hu, Ph.D. student in Computer Science, SUNY Albany.
- Yi Wei, Ph.D. student in Computer Science, SUNY Albany. (co-advise with Prof. Ming-Ching Chang).
- Ehab Albadawy, Ph.D. student in Computer Science, SUNY Albany.

Ph.D. Committee Member (Outside of SUNY Albany)

- Zuoguan Wang, Ph.D. in Electrical, Computer and System Engineering, RPI, graduated 2012.
- Jan Kovsky, Ph.D. in Electrical and Computer Engineering, SUNY Binghamton, graduated 2012.
- Li Zhang, Ph.D. student in Computer Science, RPI, graduated 2013.
- Weiyi Sun, Ph.D. student in Informatics, SUNY Albany, graduated 2014.
- Vojetech Holub, Ph.D. in Electrical and Computer Engineering, SUNY Binghamton, graduated 2014.
- Shuai Li, Ph.D. student in Computer Science, RPI, graduated 2016.

Undergraduate Research Advisor

- Ian Pradhan, B.S. in Computer Science, class of 2020, SUNY Albany
- Jeremy Birnbaum, Honor Student, Class of 2010, SUNY Albany
Now Ph.D. student in Computer Science at SUNY Albany
- Adam Polanski, Honor Student, Class of 2012, SUNY Albany

Visiting Scholars and Students

- Baoyuan Wu, Pattern Recognition Lab, Institute of Automation, Chinese Academy of Sciences, 2013 - 2014.
- Honggang Qi, University of Chinese Academy of Sciences, 2017 - 2018.
- Yanbo Fan, Pattern Recognition Lab, Institute of Automation, Chinese Academy of Sciences, 2018 - 2019.
- Ao Luo, University of Electronic Science and Technology of China, 2019 - 2020.

UNIVERSITY SERVICES

Department Services – SUNY Albany

- Fall '17 – present, Chair of CS Department Graduate Admission Committee.
- Fall '11 – Fall '14, Fall '18 – present, Chair of CS Department Colloquia Series.
- Fall '15 – Spring '16, Chair of Faculty Research Committee for Computer and Electronic Engineering Department for College of Engineering and Applied Science.
- Spring '14, Chair of Analytical Exams in Artificial Intelligence.
- Fall '13, “Evergreen” Teaching Faculty Search Committee for Informatics Department.
- Fall '13 – Spring '14, Provost’s team for Network Engineering Program.
- Fall '13 – Spring '14 Curriculum Committee of College of Computing and Information.
- Fall '12, '13 and '14, Faculty Search Committee.
- Fall '13, FRAP Committee.
- Fall '09 – Spring '14, Undergraduate Advisor.
- Fall '10 – Spring '12, Computing Oversight Committee.
- Fall '10 – Spring '12, Undergraduate Curriculum Committee.

University Services – SUNY Albany

- Spring'18, Center, Institute & Lab Task Force.
- Fall '17, Committee for the University’s Strategic Development and Planning Initiative in the subcommittee for Research and Creative Activities.
- Fall '16, University’s Strategic Development and Planning Initiative in Engineering and Technology.
- Summer '14, panelist in the University’s ITLAL Early Faculty Career Workshop.

SUNY System-wide Services

- Spring '19 – present, Member of SUNY Senior Vice Chancellor’s Scientific Advisory Panel (SAP).