Siwei Lyu
Curriculum Vitae
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EDUCATION

Ph.D.	Computer Science,	Dartmouth College, 2005
M.S.	Computer Science,	Peking University, 2000
B.S.	Information Science	Peking University, 1997

PROFESSIONAL EMPLOYMENT

2014 – present	**Associate Professor**	Computer Science Department
		University at Albany, State University of New York
2008 – 2014	**Assistant Professor**	Computer Science Department
		University at Albany, State University of New York
2005 – 2008	**Postdoc**	Howard Hughes Medical Institute
		Center for Neurosciences, New York University

PUBLICATIONS

Book & Book Chapters

1. [BookChap12] 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.

2. [Book08] Siwei Lyu. *Natural Image Statistics in Digital Image Forensics*. VDM Verlag, 2008.

Refereed Journal Articles

1. [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*, page to appear, 2019. (impact factor: 11.541).

2. [TCYB19] 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*, (to appear), 2019. (impact factor: 8.803).

3. [PR18] Xin Wang, Ming-Ching Chang, Lan Wang, and Siwei Lyu. Efficient algorithms for graph regularized PLSA for probabilistic topic modeling. *Pattern Recognition*, to appear, 2018. (impact factor: 3.962).

4. [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*, page (accepted), 2018. (impact factor: 11.541).

5. [TOMM18] Longyin Wen, Honggang Qi, and Siwei Lyu. Contrast enhancement estimation for digital image forensics. *ACM Transactions on Multimedia Computing, Communications and Applications*, page (accepted), 2018. (impact factor: 2.019).

6. [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).

7. [TIP18] Dawei Du, Longyin Wen, Honggang Qi, Qingming Huang, Tian Qi, and Siwei Lyu. Constrained graph seeking for object tracking. *IEEE Transactions on Image Processing*, 2018. (impact factor: 5.071).

8. [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).

9. [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).

10. [TIP16] Dawei Du, Honggang Qi, Wenbo Li, Longyin Wen, Qingming Huang, and Siwei Lyu. Online deformable object tracking based on structure-aware hyper-graph. *IEEE Transactions on Image Processing*, 25(8):3572 – 3584, 2016. (impact factor: 5.071).

11. [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).

12. [PAMI16] Longyin Wen, Zhen Lei, Siwei Lyu, Stan Z. Li, and Ming-Hsuan Yang. Exploiting hierarchical dense structures on hypergraphs for multi-object tracking. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 38(10):1983–1996, 2016. (impact factor: 9.455).

13. [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).

14. [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).

15. [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).

16. [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).

17. [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).

18. [PAMI08] Siwei Lyu and Eero P. Simoncelli. Modeling multiscale subbands of photographic images with fields of Gaussian scale mixtures. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 31(4):693–706, April 2009. (impact factor: 9.455).

19. [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).

20. [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).

21. [TSP05] Siwei Lyu and Hany Farid. How realistic is photorealistic? *IEEE Transactions on Signal Processing*, 53(2):845–850, Feburary 2005. (impact factor: 2.628).

22. [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).

Prestigesous Conference Papers

23. [AAAI19a] Longyin Wen, Dawei Du, Shengkun Li, Xiao Bian, and Siwei Lyu. Learning Non-Uniform Hypergraph for Multi-Object Tracking. In *AAAI Conference on Artificial Intelligence (AAAI-19)*, Honolulu, HI, United States, 2019. (Acceptance rate 16% of 7,500 submissions).

24. [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 *AAAI Conference on Artificial Intelligence (AAAI-19)*, Honolulu, HI, United States, 2019. (Acceptance rate 16% of 7,500 submissions).

25. [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).

26. [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).

27. [BMVC18] Yuezun Li, 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).

28. [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).

29. [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).

30. [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).

31. [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 Patten Recognition (CVPR)*, Salt Lake City, UT, United States, 2018. (Acceptance rate 24% of 5687 submissions).

32. [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).

33. [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.

34. [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).

35. [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).

36. [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).

37. [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).

38. [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).

39. [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).

40. [ICCV15b] Baoyuan Wu, Siwei Lyu, and Bernard S. Ghanem. ML-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).

41. [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).

42. [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 Patten Recognition (CVPR)*, Boston, MA, United States, 2015. (Acceptance rate 30% of 2400 submissions).

43. [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).

44. [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).

45. [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)

46. [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)

47. [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.

48. [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 Patten Recognition (CVPR)*, Columbus, OH, United States, 2014. (Acceptance rate 30% of 1807 submissions)

49. [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)

50. [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)

51. [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)

52. [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)

53. [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%)

54. [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)

55. [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)

56. [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)

57. [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)

58. [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%)

59. [CVPR09] Siwei Lyu. An implicit Markov random field model for natural images in multiscale oriented representations. In *IEEE Conference on Computer Vision and Patten Recognition (CVPR)*, Miami Beach, FL, United States, June 2009. (Acceptance rate 26% of 1464 submissions)

60. [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)

61. [CVPR08] Siwei Lyu and Eero P. Simoncelli. Nonlinear image representation using divisive normalization. In *IEEE Conference on Computer Vision and Patten Recognition (CVPR)*, Anchorage, AK, United States, June 2008. (Acceptance rate 24% of 1593 submissions)

62. [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%)

63. [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%)

64. [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%)

65. [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%)

66. [MM05] Siwei Lyu. Automatic image orientation determination with natural image statistics. In *ACM Multimedia*, Singapore, 2005. (Acceptance rate 32%)

67. [IH02] Siwei Lyu and Hany Farid. Detecting hidden messages using higher-order statistics and support vector machines. In *5th International Workshop on Information Hiding*, Noordwijkerhout, Netherlands, 2002. (Acceptance rate 24%)

Other Refereed Conference/Workshop Papers

68. [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.

69. [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).

70. [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.

71. [AIC18a] Milind Naphade, et.al., and Siwei Lyu. The 2018 NVIDIA AI City Challenge. In *IEEE Workshop on AI City Challenge, in conjuction with CVPR*, Salt Lake City, UT, United States, 2018.

72. [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 conjuction with CVPR*, Salt Lake City, UT, United States, 2018.

73. [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.

74. [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.

75. [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.

76. [AIC17a] 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.

77. [AIC17b] 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 (SmartWorld/SCALCOM/UIC/ATC/CBDCom/IOP/SCI)*, Smart-World'17, San Jose, NJ, United States, United States, 2017. IEEE.

78. [VOT17] (as participating team). The visual object tracking VOT2017 challenge results. In *ICCV Workshop on Visual Object Tracking Challenge*, Venice, Italy, 2017.

79. [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

80. [IJCNN17] Andrew Pulver and Siwei Lyu. LSTM with working memory. In *International Joint Conference on Neural Networks (IJCNN)*, Anchorage, AK, United States, 2017.

81. [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 conjucntion with IEEE RAS-Humanoids)*, Cancun, Mexico, 2016.

82. [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).

83. [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.

84. [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.

85. [VOTIR15] (as participating team). The visual object tracking VOTITR2015 challenge results. In *ICCV Workshop on Visual Object Tracking Challenge*, Santiago, Chile, 2015.

86. [VOT15] (as participating team). The visual object tracking VOT2015 challenge results. In *ICCV Workshop on Visual Object Tracking Challenge*, Santiago, Chile, 2015.

87. [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.

88. [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.

89. [SPIE15] Amanda Danko and Siwei Lyu. Fused methods for visual saliency estimation. In *SPIE Symposium on Electronic Imaging*, San Jose, CA, United States, 2015.

90. [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.

91. [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.

92. [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.

93. [ICIP14b] Xing Zhang and Siwei Lyu. Blind estimation of pixel brightness transform. In *IEEE Conference on Image Processing (ICIP)*, Paris, France, 2014.

94. [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.

95. [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).

96. [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).

97. [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, 2014.

98. [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.

99. [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

100. [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.

101. [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.

102. [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.

103. [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.

104. [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.

105. [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.

106. [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.

107. [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).

108. [ARTMATH05] Siwei Lyu, Dan Rockmore, and Hany Farid. Wavelet analysis for art authentication. In *Art+Math=X*, Boulder, CO, United States, 2005.

109. [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.

110. [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.

111. [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.

AWARDS AND HONORS

2018	SUNY Chancellor's Awards for Excellence in Scholarship and Creative Activities
2017	University at Albany President's Award for Excellence in Research and Creative Activities
2011	IEEE Signal Processing Society Best Paper Award
2010	National Science Foundation Early Faculty Career Development (CAREER) Award

GRANTS

2018 - 2021	Co-PI, National Science Foundation, Project # IIS-1816227: *Online AUC Maximization Algorithms for Streaming Data*, $498,333.
2018 - 2021	PI, Army Research Office, Project # 81852: *New Approaches to Combine Individual Losses*, $375,000.
2018 – 2018	Co-PI, IARPA, Deep Insight of Vision Algorithms (DIVA) Program, *Data Collection and Preparation*, $75,000.
2016 – 2020	Co-PI, DARPA Media Forensics (MediFor) Program, Contract # FA8750-16-C-0166: *Photons, Pixels, Photoshop and the Internet: Analyzing the Life-Cycle Integrity of Visual Media*, $448,000.

2015 – 2018	Co-PI, National Science Foundation, National Robotics Initiative (NRI), Project # IIS-1537257: *Continuation: A Dynamic Bayesian Approach to Real-Time Estimation and Filtering in Grasp Acquisition and Other Contact Tasks*, $220,000.
2013 – 2015	Co-PI, National Institute of Justice, Award # 2013-IJ-CX-K010: *Practitioner Centric Video Analysis*, $100,000.
2013 – 2016	PI, National Science Foundation, Project # CCF-1319800: *Blind Noise Estimation Using Signal Statistics in Random Band-Pass Domains*, $400,000.
2012 – 2015	Co-PI, National Science Foundation, National Robotics Initiative (NRI), Project # IIS-1208463: *A Dynamic Bayesian Approach to Real-Time Estimation and Filtering in Grasp Acquisition and Other Contact Tasks*, $210,000.
2011 – 2013	Co-PI, National Institute of Justice: *Recognizing Group Behavior in Surveillance Videos*, $40,000.
2010 – 2015	PI, National Science Foundation Early Faculty Career Development Award, Project # IIS-0953373: *A New Statistical Framework for Natural Images with Applications in Vision*, $500,000.
2010 – 2011	University Transportation Research Center (UTRC) – Region II: *Compressing and Mining GPS Stream Data*, $99,848.
2009 – 2011	IBM Research Center: *Statistical Patterns to Detect Financial Fraud*, $40,000.

INVITED TALKS

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, IEEE Transactions on Information Forensics and Security (2016-2019); Member of IEEE SPS Information Forensics and Security Technical Committee (2017-2019).
Conference Organizer	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 *Digital Media Forensics* in the First IEEE ChinaSIP Conference (2013).
Journal Reviewer	IEEE Transactions on Pattern Analysis and Machine Intelligence; IEEE Transactions on Image Processing; IEEE Transactions on Signal Processing; IEEE Transactions on Information Forensics and Security; International Journal on Computer Vision; Journal of Machine Learning Research, Journal of Neural Computation.
Conference Reviewer	Many conferences in machine learning and computer vision, including ECCV, ACM SIGGRAPH, CVPR, ICCV, and NIPS.
Proposal Reviewer	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 ($O\Delta K$) Member (2016 – present).

PATENTS

1. Method and System for Separating Text and Drawings in Digital Ink. U.S. Patent 7298903 (B2), 2007

2. 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

3. Computer Readable Medium for Expressing and Displaying Digital Ink and Computer System. Japan Patent JP2003141100, 2005

4. 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

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

MEDIA COVERAGE

- *DeepFakes*, Data Skeptics Podcast, September, 2018.

- *The Defense Department has produced the first tools for catching DeepFakes*, MIT Tech Review, August, 2018.

- *Deepfakes are coming. Is Big Tech ready?*, CNN Money, August, 2018.

- *AI created fake news dystopia, but now they could help to fix it*, WIRED Magazine, July, 2018.

- *UAlbany researchers working to develop 'fake news' detector*, Spectrum News, June, 2018.

- *The Eyes have it: DeepFakes Outed by Unblinking Stares*, The Register, June, 2018.

- *How can you tell if a video is a DeepFake just look at the eyes*, New Scientists Magazine, June, 2018.

- *The Reality-Distorting Tools Of The Future*, Science Friday Radio Interview, February, 2018.

- *Wenn wahr und falsch nicht mehr zu unterscheiden sind*, Austrian public broadcaster ORF, April, 2017.

- *Sleuth's Clues Lead To Frustration*, Times Union, May, 2014.

- *We're Smarter Than Buffalo and Rochester and Syracuse and ...*, Albany Business Review, March 2014.

- *Picture Imperfect, Digital Imaging: Insurers, Publishers, Law-Enforcement Agencies And Dating Sites Are Using Software That Can Detect The Digital Manipulation Of Photos*, The Economist Magazine (Technology Quarterly), March 2013.

- *Scientists Develop Method for Authenticating Digital Images by Analyzing "Noise"*, SUNY Albany News, June 2012.

- *Looking For Evidence Of Photoshop Trickery*, Law.com, June 2012.

- *Hot on the trail of photo fakers*, Times Union, May 2010.

- *UAlbany Computer Science Professor Receives Prestigious NSF Award to Develop New Tools to Detect Fake Digital Images*, SUNY Albany News, May 2012.

- *Software Detects the True Artist*, Wired News, November 2004.

- *Computer Analysis Is Bringing Science to Art*, Washington Post, November 2004.

ADVISEMENT
Post-doc Advisor

- Dr. Longyin Wen, Post-doc, 2015 – 2016
  First job: Research Scientist, GE Global Research Center.

- Dr. Xing Mei, Post-doc, 2013 – 2015
  First job: SnapChat Inc.

- Dr. Dawei Du, Post-doc, 2018 – present

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

- 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.

- 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

- Andrew Pulver, Ph.D. student in Computer Science, SUNY Albany.

- Shengkun Li, Ph.D. student in Computer Science, SUNY Albany.

- Yuezun Li, Ph.D. student in Computer Science, SUNY Albany.

- Wenbo Li, Ph.D. student in Computer Science, SUNY Albany.

- Lipeng Ke, 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).

- Nenghui Song, Ph.D. student in Computer Science, SUNY Albany. (co-advise with Prof. Ming-Ching Chang).

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

- Zuoguan Wang, Ph.D. in Electrical, Computer and System Engineering, RPI, graduated 2012.

- Jan Kovosky, 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

- 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

UNIVERSITY SERVICES

Department Services

- 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

- 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.