

Junsong Yuan

CONTACT INFORMATION

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CURRENT

State University of New York at Buffalo, Buffalo, NY, USA
Professor, CSE Department, Aug. 2021 - Present
Director of Visual Computing Lab, CSE Department

PREVIOUS

State University of New York at Buffalo, Buffalo, NY, USA
Associate Professor, CSE Department, March 2018 - Aug. 2021
Director of Visual Computing Lab, CSE Department

Nanyang Technological University, Singapore

Associate Professor, School of EEE, Sept. 2015 - March 2018
Nanyang Assistant Professor, School of EEE, Sept., 2009 - Aug. 2015

EDUCATION

Northwestern University, Evanston, Illinois, USA

Doctor of Philosophy in Electrical and Computer Engineering, August, 2009
Thesis: Mining Image and Video Data (*Outstanding EECS PhD Thesis Award*)

National University of Singapore, Singapore

Master of Engineering in Electrical and Computer Engineering, January, 2005
Thesis: Robust Short Clip Representation and Fast Search through Large Video Collections

Huazhong University of Science and Technology, Wuhan, P.R.China

Special Program for the Gifted Young
Bachelor of Engineering, Communication Engineering, July, 2002

RESEARCH INTERESTS

Computer Vision and Pattern Recognition
Video Analytics
Human Action and Gesture Analysis
Large-Scale Visual Search and Mining
Biomedical Image Analysis and Applications

INDUSTRY RESEARCH EXPERIENCE

Microsoft Research, Redmond, Washington, USA
Research Intern

June - September, 2008

Kodak Research Laboratory, Rochester, New York, USA
Research Intern

June - September, 2007

Motorola Laboratory, Schaumburg, Illinois, USA
Research Intern

June - September, 2006

Institute for Infocomm Research, Singapore
Research Scholar

January 2003 - December, 2004

TEACHING
EXPERIENCE

Coursera Course: Computer Vision Basics (with Radhakrishna Dasari) ¹

Over 68,000 enrollment to date
First course of this specialization
Received a 4.2/5.0 rating to date

CSE Department, University at Buffalo, USA

Lecture

CSE473/573 Computer vision and Image Processing, 2018-2021 Fall

Seminar

CSE707 Selected Topics in Computer Vision, 2018-2021

School of EEE, Nanyang Technological University, Singapore

Lecture

EE4476/IM4476 Image Processing, 2011-2015 1st semester
EE4483/IM4483 Artificial Intelligence and Data Mining, 2011-2017 1st semester

Tutorial

EE2010/IM2010 Signals and Systems, 2015-2017 2nd semester
EE4483/IM4483 Artificial Intelligence and Data Mining, 2011-2017 1st semester
EE4476/IM4476 Image Processing, 2012-2015 1st semester

GRANTS

PI: Video Object Detection and Segmentation, Amazon Go, Nov. 2021 - May. 2022, \$ 15,000 and \$ 7,000 AWS credit

PI: Digital Virtual Human, InnoPeak Technology, March 2021 - March 2022, \$ 50,000

Co-PI: Scaling Up Human-Action Analysis Systems, Amazon Faculty Award, USA, April 2021 - April 2022, \$ 57,000 and \$10,000 AWS Promotional Credits (with Changyou Chen as PI; my share is 25%)

PI: SCC-PG: Towards cybernetic buildings: integrated intelligent sensing to create responsive environments, National Science Foundation (NSF), USA, Oct. 2020 - Sept. 2021, \$150,000

Co-PI: Multi-media Analytics Leading to Intent and Semantic Evidence (MALISE), DARPA project, USA, July 2020 - June 2024, \$1,300,000 (with David Doermann as PI and Rahul Rai as Co-PI, my share is 30%)

PI: Hand Gesture Analysis, Kwai Research, USA, Jan. 2020 - Dec. 2020, \$ 50,000

PI: Tutorial Video Analytics, Adobe Research, USA, April 2018 - April 2019, \$ 12,000

PI: Video Captioning, Snap Research, USA, April 2018 - Dec. 2018, \$ 25,000

PI: Video Analytics for Autonomous Driving, Horizon Robotics Inc., USA Oct. 2018-Oct. 2020, \$ 360,000

¹<https://www.coursera.org/learn/computer-vision-basics>

PI: Start-up funds, University at Buffalo, March 2018 - March 2021, \$ 200,000

PI: Towards More Social Robots: Understanding Human Behaviours with 2D and 3D Sensors, Microsoft Research Asia, Dec. 2016 - Dec. 2017, S\$ 40,233, unrestricted gift ²

PI: Towards More Social Robots: Understanding Human Behaviours with 2D and 3D Sensors, Microsoft Azure credits, Dec. 2016 - Dec. 2017, US\$ 5,000

PI: A Vision-based Solution for Egocentric Hand Motion Analysis on Wearable Devices, Singapore Ministry of Education (MoE) Tier-2 Grant, July 2016 - June 2019, S\$509,040

PI: Exploring Visual Relevance to Construct a Holistic Picture of Online News, Singapore Ministry of Education (MoE) Tier-1 Grant, Nov. 2014 - Oct. 2017, S\$149,200

PI: Real-time Automated Analysis of Soccer Videos, Advanced Digital Sciences Center (ADSC), Singapore, Jan. 2016 - Jan. 2019, S\$155,000

PI: Discriminative Action States Discovery for On-line Action Recognition, Defense Science Organization (DSO) National Labs, Aug. 2016 - July 2018, S\$ 199,525

PI: Mining and Identifying Abnormal and Suspicious Activities, Singapore Defence Research and Technology Office (DRTech), Dec. 2015 - Dec. 2018, S\$ 308,000

PI: Towards The Reality of 3D Imaging and Display: Multi-Layered Computational Display, Singapore National Research Foundation (NRF), April 2014 - March 2019, S\$1,003,541

PI: General Object Recognition by Big Data Retrieval, Omron Inc., Japan, July 2015 - June 2016, S\$ 99,000

PI: Media Analytics, Singapore Media Development Authority (MDA), Dec. 2012 - Nov. 2017, S\$ 1,000,000

Joint-PI: Scene Understanding Through Bottom-up and Top-down Processing, Singapore National Research Foundation (NRF), July 2015 - June 2018, S\$ 643,600

Joint-PI: Sensor Fusion Frameworks for Objects Classification, Terrain Classification and Localization, Singapore National Research Foundation (NRF), July 2015 - June 2017, S\$ 489,000

Joint-PI: Autonomous Virtual Humans and Social Robot for Tele-presence, Singapore Media Development Authority (MDA), Feb. 2012 - March 2016, S\$ 1,512,000

PI: Abnormal Video Event Detection for Traffic Safety, NTU-JSPS Joint Research Projects, April 2012 - March 2014, S\$ 76,000

PI: Video object discovery, Adobe Systems, USA, Dec. 2013 - Aug. 2014, US\$ 26,000, unrestricted gift

PI: Hand gesture recognition using depth camera, Microsoft Research Redmond, USA, Dec. 2011 - Dec. 2012, US\$ 15,000, unrestricted gift

PI: Real-time Object Retrieval in Large Scale Video Data, Singapore Infocomm Development Authority (IDA), April - Dec. 2013, S\$430,000

²1 S\$ is around 0.70 US\$

PI: Fusion of Velodyne and Image Detection Modules, Defense Science Organization (DSO) National Labs, Feb 2012 - July 2012, S\$ 37,383

PI: Cognitive Approach for Activity Learning, Defense Science Organization (DSO) National Labs, Dec. 2012 - Nov. 2014, S\$ 160,080

PI: Towards the reality of autonomous vehicles, College of Engineering Seed Grant, NTU, Oct. 2012 - March 2013, S\$ 46,000

PI: Integrating a User within a group or a crowd using Computer Vision and Synthetic Vision, IMI Seed Grant, Institute for Media Innovation, NTU, Dec. 2012 - June 2014, S\$ 89,000

PI: Mining Image and Video Data, Nanyang Assistant Professorship, NTU, Sept. 2009 - Aug. 2012, S\$ 1,000,000

Co-PI: Towards Reality of Integrated 3D Imaging and Display, EEE Seed Grant, NTU, Oct. 2012 - March 2013, S\$ 50,000

Co-PI: NTU-MGH Programme on Clinical Neurotechnologies, EEE Seed Grant, NTU, Oct. 2012 - March 2013, S\$ 48,000

Collaborator: Towards 3D nanoscope with super spatial resolution, Ministry of Education Tier-2 Grant, April 2013- March 2016, S\$723,500

Collaborator: Low Power Frame-less Image Sensor for High Speed Object Tracking, Ministry of Education Tier-1 Grant, Nov. 2014- Oct 2017, S\$215,500

HONORS AND AWARDS

Fellow of Institute of Electrical and Electronics Engineers (IEEE), 2021

Fellow of Asia-Pacific Artificial Intelligence Association (AAIA), 2021

UB CSE Senior Researcher of the Year Award, 2020

Fellow of International Association of Pattern Recognition (IAPR), 2018

Best Paper Award, International Conference on Advanced Robotics (ICAR), 2017

Best Paper Award, IEEE Trans. on Multimedia, 2016

Outstanding EECS PhD Thesis Award, Northwestern University, USA, 2010

Nanyang Assistant Professorship, Nanyang Technological University, 2009

Doctoral Spotlight Award, IEEE Conf. Computer Vision and Pattern Recognition, 2009

National Outstanding Student, Ministry of Education, China, 2001

Hu Chunan Fellowship, Ministry of Education, China, 2001 (100 from entire China)

Model of Outstanding Students, Huazhong Univ. of Sci. and Tech., China, 2000 (20 out of 30,000)

BOOKS

1. Hongxing Wang, Chaoqun Weng, and Junsong Yuan, Visual Pattern Discovery and Recognition, by Springer, 2017
2. Nadia Magnenat Thalmann, Junsong Yuan, Daniel Thalmann, Bum-Jae You, Context Aware Human-Robot and Human-Agent Interaction, by Springer, 2015
3. Gang Yu, Junsong Yuan, and Zicheng Liu, Human Action Analysis with Randomized Trees, by Springer, 2015
4. Junsong Yuan, Discovering visual patterns in image and video data: concepts, algorithms, experiments, by VDM Verlag Dr. Muller, April 2011

BOOK CHAPTERS

1. Liuhao Ge and Junsong Yuan, "Hand Pose Estimation," invited book chapter in *Computer Vision: A Reference Guide*, Springer, 2020
2. Liuhao Ge, Junsong Yuan, and Nadia Thalmann, "Real-time Hand Pose Estimation Using Depth Camera," invited book chapter in *RGB-D Image Analysis and Processing*, Springer, 2019
3. Gangqiang Zhao and Junsong Yuan, "Automatic Visual Pattern Discovery via Cohesive Sub-graph Mining," invited book chapter in *Mobile Cloud and Visual Media Computing*, Springer, 2016
4. Yang Cong, Ji Liu, Junsong Yuan, and Jiebo Luo, "Low Rank Online Metric Learning", invited book chapter in *Low-Rank and Sparse Modeling for Visual Analysis*, Springer, 2014
5. Hui Liang and Junsong Yuan, "Hand Parsing and Gesture Recognition with a Commodity Depth Camera", invited book chapter in *Computer Vision and Machine Learning with RGB-D Sensors*, Springer, 2014
6. Zhu Li, Yun Fu, Junsong Yuan, Ying Wu, A. K. Katsaggelos and Thomas S. Huang, "Multi-media Data Indexing", invited book chapter in *Semantic Mining Technologies for Multimedia Databases*, Idea Group Inc., 2010
7. Junsong Yuan and Ying Wu, "Common pattern discovery in multimedia data mining", invited book chapter in *Encyclopedia of Data Warehousing and Mining (2nd Edition)*, Idea Group Inc., 2008

JOURNAL PUBLICATIONS

1. Yujun Cai, Liuhao Ge, Jianfei Cai, Nadia Thalmann, and Junsong Yuan, "3D Hand Pose Estimation Using Synthetic Data and Weakly Labeled RGB Images," in *IEEE Trans. on Pattern Analysis and Machine Intelligence (T-PAMI)*, 2021
2. Sheng Liu, Zhou Ren, and Junsong Yuan, "SibNet: Sibling Convolutional Encoder for Video Captioning," in *IEEE Trans. on Pattern Analysis and Machine Intelligence (T-PAMI)*, 43(9): 3259-3272, 2021
3. Jing Tang, Xueyan Tang, Andrew Lim, Kai Han, Chongshou Li, Junsong Yuan, "Revisiting Modified Greedy Algorithm for Monotone Submodular Maximization with a Knapsack Constraint," In Proc. ACM Meas. Anal. Comput. Syst. 5(1): 08:1-08:22, 2021
4. Yujin Chen, Zhigang Tu, Di Kang, Ruizhi Chen, Linchao Bao, Zhengyou Zhang, Junsong Yuan, "Joint Hand-Object 3D Reconstruction From a Single Image With Cross-Branch Feature Fusion," in *IEEE Trans. Image Processing (T-IP)*, 30: 4008-4021 2021
5. Koteswar Rao Jerripothula, Jianfei Cai, Jiangbo Lu, Junsong Yuan, "Image Co-Skeletonization via Co-Segmentation," in *IEEE Trans. Image Processing (TIP)* 30: 2784-2797, 2021
6. Tan Yu, Jingjing Meng, Ming Yang, Junsong Yuan, "3D Object Representation Learning: A Set-to-Set Matching Perspective," in *IEEE Trans. on Image Processing (T-IP)*, 30: 2168-2179, 2021
7. Jianyu Yang, Wu Liu, Junsong Yuan, and Tao Mei, "Hierarchical Soft Quantization for Skeleton-Based Human Action Recognition," in *IEEE Trans. on Multimedia (T-MM)*, 2021
8. Liangchen Song, Gang Yu, Junsong Yuan, Zicheng Liu, "Human pose estimation and its application to action recognition: A survey," *J. Vis. Commun. Image Represent. (JVCI)*, 76: 103055, 2021
9. Lin Huang, Boshen Zhang, Zhilin Guo, Yang Xiao, Zhiguo Cao, Junsong Yuan, "Survey on depth and RGB image-based 3D hand shape and pose estimation," in *Virtual Reality and Intelligent Hardware* 3(3): 207-234, 2021
10. Weixiang Hong, Xueyan Tang, Jingjing Meng, and Junsong Yuan, "Asymmetric Mapping Quantization for Nearest Neighbor Search," in *IEEE Trans. on Pattern Analysis and Machine Intelligence (T-PAMI)*, 42(7): 1783-1790, 2020

11. Tan Yu, Jingjing Meng, Chen Fang, Hailin Jin, and Junsong Yuan, "Product Quantization Network for Fast Visual Search," in *International Journal of Computer Vision (IJCV)*, 128(8): 2325-2343, 2020
12. Zhenzhen Wang, Weixiang Hong, Yap-Peng Tan, and Junsong Yuan, "Pruning 3D Filters For Accelerating 3D ConvNets," *IEEE Trans. on Multimedia (T-MM)*, 22(8): 2126-2137, 2020
13. Junwu Weng, Xudong Jiang, Junsong Yuan, and Wei-Long Zheng, "Early Action Recognition with Category Exclusion using Policy-based Reinforcement Learning," *IEEE Trans. on Circuits and Systems for Video Technology (T-CSVT)*, 30(12): 4626-4638 2020
14. Chunlun Zhou and Junsong Yuan, "Occlusion Pattern Discovery for Partially Occluded Object Detection," in *IEEE Trans. on Circuits and Systems for Video Technology (T-CSVT)*, 30(7): 2067-2080, 2020
15. Bin Jiang, Wenxuan Tu, Chao Yang, and Junsong Yuan, "Context-Integrated and Feature-Refined Network for Lightweight Object Parsing," in *IEEE Trans. Image Processing (T-IP)*, 29: 5079-5093, 2020
16. Long Tian, Zhigang Tu, Dejun Zhang, Jun Liu, Baoxin Li, Junsong Yuan, "Unsupervised Learning of Optical Flow With CNN-Based Non-Local Filtering," in *IEEE Trans. Image Processing (T-IP)* 8429-8442 2020
17. Guilei Hu, Yang Xiao, Zhiguo Cao, Lubin Meng, Zhiwen Fang, Joey Tianyi Zhou, and Junsong Yuan, "Towards Real-time Eyeblick Detection in The Wild: Dataset, Theory and Practices," *IEEE Trans. on Information Forensics and Security (T-IFS)*, 15: 2194-2208, 2020
18. Mengjia Yan, Jingjing Meng, Chunlun Zhou, Zhigang Tu, Yap-Peng Tan, and Junsong Yuan, "Detecting Spatiotemporal Irregularities in Videos via a 3D Convolutional Autoencoder," in *Journal of Visual Communication and Image Representation (JVCI)*, 67: 102747, 2020
19. Xiaohan Tu, Cheng Xu, Siping Liu, Guoqi Xie, Jing Huang, Renfa Li, Junsong Yuan, "Learning Depth for Scene Reconstruction Using an Encoder-Decoder Model," *IEEE Access* 8: 89300-89317, 2020
20. Lihao Ge, Hui Liang, Junsong Yuan, Daniel Thalmann, "Real-time 3D Hand Pose Estimation with 3D Convolutional Neural Networks," in *IEEE Trans. on Pattern Analysis and Machine Intelligence (T-PAMI)*, 41(4): 956-970, 2019
21. Feng Zhao, Zhiguo Cao, Yang Xiao, Jing Mao, Junsong Yuan, "Real-time Detection of Fall from Bed using a Single Depth Camera," in *IEEE Transactions on Automation Science and Engineering (T-ASE)*, 16(3): 1018-1032, 2019
22. Hui Liang, Junsong Yuan, Jun Lee, Lihao Ge, and Daniel Thalmann, "Spatially-Optimized Hough Forest for Robust Palm Pose Tracking with Arbitrary Hand Postures," in *IEEE Trans. on Cybernetics (T-CYB)*, 49(2): 527-541, 2019
23. Zhigang Tu, Hongyan Li, Dejun Zhang, Justin Dauwels, Baoxin Li, Junsong Yuan, "Action-Stage Emphasized Spatiotemporal VLAD for Video Action Recognition," in *IEEE Trans. Image Processing (T-IP)*, 28(6): 2799-2812, 2019
24. Zhi Gao, Yuwei Wu, Xingyuan Bu, and Yunde Jia, Tan Yu, Junsong Yuan, "Learning a Robust Representation via a Deep Network on Symmetric Positive Definite Manifolds," in *Pattern Recognition (PR)*, 92: 1-12, 2019
25. Chunlun Zhou and Junsong Yuan, "Multi-label Learning of Part Detectors for Occluded Pedestrian Detection," in *Pattern Recognition (PR)*, 86: 99-111, 2019
26. Yuwei Wu, Feng Gao, Yicheng Huang, Jie Lin, Vijay Chandrasekhar, Junsong Yuan, Ling-Yu Duan, "Codebook-Free Compact Descriptor for Scalable Visual Search," in *IEEE Trans. Multimedia (T-MM)* 21(2), 388-401, 2019
27. Jiaqi Zhang, Zhenzhen Wang, Jingjing Meng, Yap-Peng Tan, and Junsong Yuan, "Boosting Positive and Unlabeled Learning for Anomaly Detection with Multi-features," in *IEEE Trans. on Multimedia (T-MM)*, 21(5): 1332-1344, 2019

28. Bin Jiang, Xin Huang, Chao Yang, and Junsong Yuan, "SLTFNet: A spatial and language-temporal tensor fusion network for video moment retrieval," in *Information Processing and Management*, 56(6), 2019
29. Zhigang Tu, Wei Xie, Dejun Zhang, Ronald Poppe, Remco C. Veltkamp, Baoxin Li, Junsong Yuan, "A survey of variational and CNN-based optical flow techniques," in *Signal Processing: Image Communication*, 72: 9-24, 2019
30. Weichao Shen, Yuwei Wu, Junsong Yuan, Lingyu Duan, Jian Zhang, and Yunde Jia, "Robust Distracter-Resistive Tracker via Learning A Multi-component Discriminative Dictionary," in *IEEE Trans. on Circuits and Systems for Video Technology (T-CSVT)*, 29(7): 2012-2028, 2019
31. Zhigang Tu, Wei Xie, Justin Dauwels, Baoxin Li, and Junsong Yuan, "Semantic Cues Enhanced Multi-modality Multi-Stream CNN for Action Recognition," in *IEEE Trans. on Circuits and Systems for Video Technology (T-CSVT)*, 29(5): 1423-1437, 2019
32. Junwu Weng, Chaoqun Weng, Junsong Yuan, and Zicheng Liu, "Discriminative Spatio-Temporal Pattern Discovery for 3D Action Recognition", in *IEEE Trans. on Circuits and Systems for Video Technology (T-CSVT)*, 29(4): 1077-1089, 2019
33. Koteswar Rao Jerripothula, Jianfei Cai, and Junsong Yuan, "Efficient Video Object Co-localization with Co-saliency Activated Tracklets", in *IEEE Trans. on Circuits and Systems for Video Technology (T-CSVT)*, 29(3): 744-755, 2019
34. Rui Zhong, Ionut Schiopu, Bruno Cornelis, Shao-Ping Lu, Junsong Yuan, Adrian Munteanu, "Dictionary Learning-based, Directional and Optimized Prediction for Lenslet Image Coding," in *IEEE Trans. on Circuits and Systems for Video Technology (T-CSVT)*, 29(4): 1116-1129, 2019
35. Jing Tang, Xueyan Tang, and Junsong Yuan, "An Efficient and Effective Hop-Based Approach for Influence Maximization in Online Social Networks," in *Social Network Analysis and Mining (SNAM)*, 8(1): 10, 2018
36. Ling-Yu Duan, Yuwei Wu, Lingbo Yang, Yicheng Huang, Zhe Wang, Junsong Yuan, and Wen Gao, "Minimizing Reconstruction Bias Hashing via Joint Projection Learning and Quantization," in *IEEE Trans. on Image Processing (T-IP)*, 27(6): 3127-3141, 2018
37. Jingjing Meng, Suchen Wang, Hongxing Wang, Junsong Yuan, and Yap-Peng Tan, "Video Summarization via Multi-View Representative Selection," in *IEEE Trans. on Image Processing (T-IP)*, 27(5): 2134-2145, 2018
38. Weixiang Hong and Junsong Yuan, "Fried Binary Embedding: from High-Dimensional Visual Features to High-Dimensional Binary Codes ," in *IEEE Trans. on Image Processing (T-IP)*, 27(10): 4825-4837, 2018
39. Zhenzhen Wang and Junsong Yuan, "Simultaneously Discovering and Localizing Common Objects in Wild Images," in *IEEE Trans. on Image Processing (T-IP)*, 27(9): 4503-4515, 2018
40. Jiong Yang and Junsong Yuan, "Temporally Enhanced Image Object Proposals for Online Object and Action Detection," in *Journal of Visual Communication and Image Representation (JVCI)*, 53: 245-256, 2018
41. Hongxing Wang and Junsong Yuan, "Representative Selection on a Hypersphere," in *IEEE Signal Processing Letter (SPL)*, 2018
42. Junlin Hu, Jiwen Lu, Yap-Peng Tan, Junsong Yuan, and Jie Zhou, "Local Multi-Metric Learning for Face and Kinship Verification," in *IEEE Trans. on Circuits and Systems for Video Technology (T-CSVT)*, 28(8): 1875-1891, 2018
43. Zhigang Tu, Wei Xie, Qianqing Qin, Ronald Poppe, RC Veltkamp, Baoxin Li, and Junsong Yuan, "Multi-Stream CNN: Applying Human-Related Region Based Descriptors for Action Recognition," in *Pattern Recognition (PR)*, 79: 32-43, 2018

44. Jing Tang, Xueyan Tang, and Junsong Yuan, "Profit Maximization for Viral Marketing in Online Social Networks: Algorithms and Analysis," in *IEEE Trans. on Knowledge and Data Engineering (T-KDE)*, 30(6): 1095-1108, 2018
45. Das Bhattacharjee Sreyasee, Junsong Yuan, Yicheng Huang, Jingjing Meng, and Lingyu Duan, "Sketch based object search via Query Adaptive Re-ranking," in *IEEE Trans. on Multimedia (T-MM)*, 20(10): 2761-2773, 2018
46. Koteswar Rao Jerripothula, Jianfei Cai and Junsong Yuan, "Quality-guided Fusion-based Co-saliency Estimation for Image Co-segmentation and Co-localization", in *IEEE Trans. on Multimedia (T-MM)*, 20(9): 2466-2477, 2018
47. Liuhaohao Ge, Hui Liang, Junsong Yuan, Daniel Thalmann, "Robust 3D Hand Pose Estimation from Single Depth Images using Multi-View CNNs," in *IEEE Trans. on Image Processing (T-IP)*, 27(9): 4422-4436, 2018
48. Jing Tang, Xueyan Tang, and Junsong Yuan, "Traffic-Optimized Data Placement for Social Media," *IEEE Trans. on Multimedia (T-MM)*, Vol. 20, No. 4, pp. 1008-1023, 2018
49. Philip Anthony Surman, Shizheng Wang, Junsong Yuan, and Yuanjin Zheng, "One-stop Measurement Model for Fast and Accurate Tensor Display Characterization," *Journal of the Optical Society of America*, 2018
50. Hongxing Wang, Yoshinobo Kawahara, Chaoqun Weng, and Junsong Yuan, "Representative Selection with Structured Sparsity," in *Pattern Recognition (PR)*, Vol. 63, pp. 268-278, 2017
51. Zhigang Tu, Wei Xie, Mengjia Yan, Remco C. Veltkamp, Baoxin Li, and Junsong Yuan, "Fusing Disparate Object Signatures for Salient Object Detection in Videos," in *Pattern Recognition (PR)*, Vol. 72, pp. 285-299, 2017
52. Anirban Chakraborty, Bappaditya Mandal, and Junsong Yuan, "Person Re-identification Using Multiple Egocentric Views," in *IEEE Trans. on Circuits and Systems for Video Technology (T-CSVT)*, Vol. 27, No. 3, pp. 484-498, 2017
53. Jianfeng Ren, Xudong Jiang, Junsong Yuan, and Nadia Thalmann, "Sound-Event Classification Using Robust Texture Features for Robot Hearing," in *IEEE Trans. on Multimedia (T-MM)*, Vol. 19, No. 3, pp. 447-458, 2017
54. Jianfeng Ren, Xudong Jiang, and Junsong Yuan, "LBP-Structure Optimization with Symmetry and Sparsity Regularizations for Scene Classification," in *IEEE Signal Processing Letter (SPL)*, Vol. 24, No. 1, pp. 37-41, 2017
55. Chaoqun Weng, Hongxing Wang, Junsong Yuan, and Xudong Jiang, "Discovering Class-Specific Spatial Layouts for Scene Recognition," in *IEEE Signal Processing Letter (SPL)*, Vol. 24, No. 8, pp. 1143-1147, 2017
56. Kang Dang and Junsong Yuan, "Learning Location Constrained Pixel Classifiers for Image Parsing with Regular Spatial Layout", in *Journal of Visual Communication and Image Representation (JVCI)*, 2017
57. Shizheng Wang, Ong Kien Seng, Philip Anthony Surman, Junsong Yuan, Yuanjin Zheng, and Xiaowei Sun, "Quality of Experience Measurement for Light Field 3D Displays on Multilayer LCDs," *Journal of the Society for Information Display (JSID)*, 2017
58. Zhiwen Fang, Zhiguo Cao, Yang Xiao, Lei Zhu, and Junsong Yuan, "Adobe Boxes: Locating Object Proposals using Object Adobes," in *IEEE Trans. on Image Processing (T-IP)*, Vol. 25, No. 9, pp. 4116-4128, 2016
59. Jiong Yang, Brian Price, Xiaohui Shen, Zhe Lin, Junsong Yuan, "Fast appearance modeling for automatic primary video object segmentation," in *IEEE Trans. on Image Processing (T-IP)*, Vol. 25, No. 2, pp. 503-515, 2016
60. Jianyu Yang, Hongxing Wang, Junsong Yuan, Youfu Li, Jianyang Liu, "Invariant Multi-Scale Descriptor for Shape Representation, Matching and Retrieval", in *Computer Vision and Image Understanding (CVIU)*, Vol. 145, pp. 43-58, 2016

61. Jiong Yang, Gangqiang Zhao, Junsong Yuan, Xiaohui Shen, Zhe Lin, Brian Price, Jonathan Brandt, "Discovering Primary Objects in Videos by Saliency Fusion and Iterative Appearance Estimation," in *IEEE Trans. on Circuits and Systems for Video Technology* (T-CSVT), Vol. 26, No. 6, pp. 1070-1083, 2016
62. Koteswar Rao Jerripothula, Jianfei Cai and Junsong Yuan, "Image Co-segmentation via Saliency Co-fusion", in *IEEE Trans. on Multimedia* (T-MM), Vol. 18, No. 9, pp. 1896-1909, 2016
63. Das Sreyasee, Junsong Yuan, Yap-Peng Tan, Ling-Yu Duan, "Query-adaptive Small Object Search using Object Proposals and Shape-aware Descriptors," in *IEEE Trans. on Multimedia* (T-MM), Vol. 18, No. 4, pp. 726-737, 2016
64. Jingjing Meng, Junsong Yuan, Jiong Yang, Yap-Peng Tan, Gang Wang, "Object Instance Search in Videos via Spatio-Temporal Path Discovery", in *IEEE Trans. on Multimedia* (T-MM), Vol. 18, No. 1, pp. 116-127, 2016
65. Jianyu Yang, Junsong Yuan, Youfu Li, "Parsing 3D motion trajectory for gesture recognition," *Journal of Visual Communication and Image Representation* (JVCI), Vol. 38, pp. 627-640, 2016
66. Ye Luo, Junsong Yuan, and Jianwei Lu, "Finding Spatio-temporal Salient Paths for Video Objects Discovery," *Journal of Visual Communication and Image Representation* (JVCI), Vol. 38, pp. 45-54, 2016
67. Bo Hu, Junsong Yuan, and Yuwei Wu, "Discriminative Action States Discovery for On-line Action Recognition," in *IEEE Signal Processing Letter* (SPL), Vol. 23, No. 10, pp. 1374-1378, 2016
68. Gangqiang Zhao, Junsong Yuan, Gang Hua, and Jiong Yang, "Topical Video Object Discovery from Key Frames by Modeling Word Co-occurrence Prior", *IEEE Trans. on Image Processing* (T-IP), Vol. 24, No. 12, pp. 5739-5752, 2015
69. Yuwei Wu, Yunde Jia, Peihua Li, Jian Zhang, and Junsong Yuan, "Manifold Kernel Sparse Representation of Symmetric Positive Definite Matrices and Its Applications," in *IEEE Trans. on Image Processing* (T-IP), Vol. 24, No. 11, pp. 3729-3741, 2015
70. Yuning Jiang, Jingjing Meng, Junsong Yuan, and Jiebo Luo, "Randomized Spatial Context for Object Search," in *IEEE Trans. on Image Processing* (T-IP), Vol. 24, No. 6, pp. 1748-1762, 2015
71. Jianfeng Ren, Xudong Jiang, and Junsong Yuan, "A Chi-Squared-Transformed Subspace of LBP Histogram for Visual Recognition," in *IEEE Trans. on Image Processing* (T-IP), Vol. 24, No. 6, pp. 1893-1904, 2015
72. Yuwei Wu, Mingtao Pei, Min Yang, Junsong Yuan, and Yunde Jia, "Robust Discriminative Tracking via Landmark-based Label Propagation", in *IEEE Trans. on Image Processing* (T-IP), Vol. 24, No. 5, pp. 1510-1523, 2015
73. Hongxing Wang and Junsong Yuan, "Collaborative Multi-feature Fusion for Transductive Spectral Learning" in *IEEE Trans. on Cybernetics*, Vol. 45, No. 3, pp 465-475, 2015
74. Jianfeng Ren, Xudong Jiang, and Junsong Yuan, "Learning LBP Structure by Maximizing the Conditional Mutual Information," in *Pattern Recognition* (PR), Vol. 48, No. 10, pp. 3180-3190, 2015
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215. Ling-Yu Duan, Junsong Yuan, Qi Tian and Changsheng Xu, “Fast and Robust Short Video Clip Search Using an Index Structure,” in *Proc. of ACM Int’l Conf. on Multimedia (MM’04)*, pp.756-757, 2004. (*demonstration*)

PATENTS

1. Lihua Xie, Cheng Wang, and Junsong Yuan, “Simultaneous Localization and Mapping Methods and Apparatus,” US patent filed 07/2017
2. Cheng Wang, Lihua Xie, and Junsong Yuan, “A Fast Dense Method For Inertial-Visual SLAM,” Singapore provisional patent, Filed 09/2016
3. Xiaowei Sun, Shizheng Wang, Jiew Siew Lim, Junsong Yuan, Philip Anthony Surman, “Head Tracked Multiview 3D Display,”, Singapore provisional patent, Filed 04/2015
4. Junsong Yuan and Hui Liang, “Estimating the hand pose using a single RGB camera”, Singapore provisional patent, Filed 09/2014.
5. Junsong Yuan, Yuning Jiang and Jingjing Meng, “System and method For large scale visual object search”, US provisional patent, Filed 05/2012.

6. Junsong Yuan, Zhou Ren and Jingjing Meng, "System and method for robust hand gesture recognition using commodity depth sensor", US provisional patent, Filed 10/2011.
7. Zicheng Liu and Junsong Yuan, "Efficient action detection through sub-volume mutual information maximization", US Patent pending, US 2010/0315506 A1, Filed 06/10/2009.
8. Jiebo Luo and Junsong Yuan, "Image classification using capture-location-sequence information", US Patent issued, US 8,055,081 B2, Filed 04/14/2008, Issued 11/08/2011.
9. Junsong Yuan, Wei Wang, Zhu Li and Dongge Li, "Method and apparatus for video clip searching and mining", US Patent pending, US 2008/0226173 A1, Filed 03/13/2007.

MEMBERSHIP

Member, IEEE Conf. on Multimedia (ICME) Steering Committee, 2018-2019
Member, IEEE Image, Video, and Multidimensional Signal Processing Technical Committee IVMSPTC, 2020 - 2024
Member, IEEE Multimedia System and Applications Technical Committee (MSA-TC), 2014 - 2022
Member, IEEE Visual Signal Processing and Communications Technical Committee (VSPC-TC), 2014 - 2020

SERVICE FOR REFEREED JOURNALS

Senior Area Editor, Journal of Visual Communications and Image Representation (JVCI), 2018 - present
Associate Editor, Machine Vision and Applications (MVA), 2020 - present
Associate Editor, IEEE Transactions on Image Processing (T-IP), 2016 - 2020
Associate Editor, IEEE Trans. on Circuits and Systems for Video Technology (T-CSVT), 2016 - 2019
Associate Editor, The Visual Computer Journal (TVC), 2013 - present
Associate Editor, IPSJ Trans. on Computer Vision and Applications (CVA), 2015 - 2017
Guest Editor³, ACM Transactions on Multimedia Computing, Communications, and Applications (ToMM), 2020-2021 **Guest Editor**⁴, International Journal of Computer Vision (IJCV), 2014-2015

SERVICE FOR REFEREED CONFERENCES

General Co-Chair
 IEEE Conference on Multimedia Expo (ICME'24)

Technical Program Co-Chair
 IEEE Conference on Multimedia Expo (ICME'18)
 IEEE Conference on Visual Communications and Image Processing (VCIP'15)

Workshop Co-Organizer
 IEEE CVPR 2015 Workshop on Large-scale video search and mining (LSVSM'15)
 SIGGRAPH Asia 2014 Workshop on Autonomous Virtual Humans and Social Robot for Telepresence
 IEEE ICCV 2013 Workshop on Large-scale video search and mining (LSVSM'13)
 IEEE CVPR 2013 Workshop on Human action understanding from 3D data (HAU3D'13)
 IEEE CVPR 2012 Workshop on Human action understanding from 3D data (HAU3D'12)
 IEEE CVPR 2012 Workshop on Large-scale video search and mining (LSVSM'12)

Organizing Co-Chair
 Asian Conf. on Computer Vision (ACCV'14)

Area Chair
 IEEE Conf. on Computer Vision and Pattern Recognition (CVPR'17'19'20'21'22)
 IEEE Conf. on Computer Vision (ICCV'21)
 ACM Conf. on Multimedia (ACM MM'18)

³Special Issue on Explainable AI on Multimedia Computing

⁴Special Issue on Human Activity Understanding from 2D and 3D Data

IEEE Conf. on Image Processing (ICIP'17'18)
International Conf. on Pattern Recognition (ICPR'16'18)
Asian Conference on Computer Vision (ACCV'14'18)
IEEE Winter Conference on Applications and Computer Vision (WACV'14'19)
IEEE Conference on Multimedia Expo (ICME'14'15)

Tutorial Chair

ACM Conference on Multimedia Retrieval (ICMR'15)

Workshop Co-Chair

Asian Conf. on Pattern Recognition (ACPR'19)

Publication Co-Chair

IEEE Conf. on Multimedia Expo (ICME'16)

Web Chair

IEEE Conf. on Computer Vision and Pattern Recognition (CVPR'17)

Brave New Ideas Co-Chair

ACM Conf. on Multimedia (ACM MM'20)

Doctoral Symposium Co-Chair

ACM Conf. on Multimedia (ACM MM'18)

Senior Program Committee Member

AAAI Conference on Artificial Intelligence (AAAI'20)
International Joint Conference on Artificial Intelligence (IJCAI'18)

International Advisory Committee Member

IAPR International Conference on Computer Vision and Image Processing (CVIP'21)

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GRADUATE
STUDENTS

Yuanhao Zhai (Ph.D. of UB; co-supervise with Dave Doermann, expected 2026)

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Nan Xi (Ph.D. of UB, expected 2025)

Jialian Wu (Ph.D. of UB, expected 2024)

Liangchen Song (Ph.D. of UB, expected 2024)

Sudhir Kumar (Ph.D. of UB, expected 2024)

Lin Huang (Ph.D. of UB, expected 2023)

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Microsoft Research Asia Fellowship 2011

Jiaqi Zhang (M.Eng. of NTU, 2018)
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now: Senior Research Lead, Wormpex AI Research, Seattle, USA

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Suchen Wang (Research Assistant, Oct. 2016 - March 2018)
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Dr. Mengyuan Liu (Post-Doc research fellow, Aug. 2017 - March 2018)
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Dr. Shizheng Wang (Post-Doc research fellow, April 2014 - Aug. 2017)
now: Associate Professor at Chinese Academy of Science, Beijing, China
Chinese Academy of Science Hundred Talents Program (category C)

Dr. Anirban Chakraborty (Post-Doc research fellow, Nov. 2015 - Dec. 2016)
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Dr. Das Bhattacharjee Sreyasee (Post-Doc research fellow, Aug. 2014 - Nov. 2016)
now: Assistant Professor of Teaching at University at Buffalo, Buffalo, USA

Dr. Yuwei Wu (Post-Doc research fellow, Aug. 2014 - Aug. 2016)
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Dr. Jianfeng Ren (Research Associate, Aug. 2010 - July 2015)
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Dr. Du Tran (Research Associate, April 2010 - July 2012)
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Dr. Yang Cong (Post-Doc research fellow, May 2010 - April 2011)
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Dr. Zhenzhong Chen (senior research scientist, Sept. 2011 - March 2012)
now: Professor at Wuhan University, Wuhan, China
1000Plan Professorship for Young Talents

KEYNOTES AND
TUTORIALS

Keynote: Hand Sensing for Interactive Augmentation
Computer Graphics International (CGI), Calgary, Canada, June 2019

Keynote: Towards More Intelligent Machines: Understanding Human Behaviours with 2D and 3D Sensors
International Conference on Internet Multimedia Computing and Services (ICIMCS), Nanjing, China, Aug. 2018

Tutorial: Human Pose Estimation and Action Recognition (with Dr. Gang Yu and Dr. Zicheng Liu)
IEEE Conf. on Image Processing (ICIP'19), Taipei, Taiwan, Sept. 2019

Tutorial: Mining Image and Video Data (with Prof. Ying Wu)
Asian Conf. on Computer Vision (ACCV'14), Singapore, Nov. 2014

Tutorial: Mining Image and Video Data
IEEE Conf. on Image Processing (ICIP'13), Melbourne, Australia, Sept. 2013

Tutorial: Understanding human actions with 2D and 3D sensors (with Dr. Zicheng Liu)
IEEE Conf. on Automatic Face and Gesture Recognition (FG'13), Shanghai, China, April 2013

Tutorial: Social Robots and Virtual Humans in 3D TelePresence (with Prof. Nadia Thalmann and Prof. Daniel Thalmann)
SIGGRAPH Intl. Conf. on Virtual-Reality Continuum and its Applications in Industry (VRCAI'12), Singapore, Dec. 2012

Tutorial: Human action analysis with 2D and 3D sensors (with Dr. Zicheng Liu)
IEEE Conf. on Multimedia Expo (ICME'12), Melbourne, Australia, July 2012

SERVICES AT UB

Senate of the University (50 elected members in total), Sept. 2021 - Aug. 2023
Chair, Tenure Track Hire Search Committee, CSE, University at Buffalo, 2021-2022
Chair, Learning Science Clustering Hire Search Committee, SEAS, University at Buffalo, 2021-2022
Member, SUNY Empire Innovation Program (EIP) faculty search committee, University at Buffalo (UB), 2019-2020 and 2020-2021
Member, Graduate Admission Committee, CSE, University at Buffalo, 2018-2019, 2019-2020, 2020-2021
Member, CSE Distinguished Speaker committee, CSE, University at Buffalo, 2019-2020, 2020-2021

SERVICES AT NTU

Senate of the University (50 elected members in total), July 2016 - March 2018
NTU Research Council member for Informatics and Mathematics, Dec. 2015 - March 2018
Program director of video analytics, School of EEE, Oct. 2011 - Sept. 2016