



Curriculum Vitae

Jiandong Tian, Ph.D., Professor

Robot/Computer Vision Group

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Professional Background

Education

2005.9- 2011.7 Ph.D., Pattern Recognition and Intelligent System.

Shenyang Institute of Automation, Chinese Academy of Sciences

2001.9-2005.7 B.S. degree, Automation, Heilongjiang University, China

Employment

2017.1- Full professor, Shenyang Institute of Automation, Chinese Academy of Sciences

2015.6-2016.6 Visiting scholar, Center for Visual Computing, University of California, San Diego (UCSD)

2013.1-2016.12 Associate professor, Shenyang Institute of Automation, Chinese Academy of Sciences

2011.7-2013.1 Assistant professor, Shenyang Institute of Automation, Chinese Academy of Sciences

Research Interests: -My research interests focus on robot/computer vision in complicated illumination and meteorological conditions. Scopes includes, **Illumination and reflectance modelling.** Spectral power distribution calculations for direct sunlight and diffuse skylight; spectral reflectance recovery from a single image; optimal basis functions deriving for spectral reflectance recovery.

Shadow and highlight Processing. Shadow modelling and shadow features deriving; shadow detection and removal for a single color image; obtaining shadow-free image without shadow detection; highlight removal.

Vision in bad weather. Video Desnowing and Deraining; fog and scattering modelling; underwater descattering.

Imagery modelling. Imaging pipeline simulation, polarization, light field, and 3D camera.

New camera for computer vision. Designing a shadow-free, weather-free, and highlight-free camera.

Publications

(* means corresponding author paper)

1. **Jiandong Tian**, Zhi Han, Weihong Ren, Yandong Tang, "Snowflake removal for videos by foreground and background decomposition via low rank factorization", *IEEE Trans. Multimedia*, Accepted.
2. Liangqiong Qu, **Jiandong Tian***, Huijie Fan, Wentao Li, Yandong Tang, "Evaluation of shadow features", *IET Computer Vision*, Volume 12, Issue 1, pp. 95 – 103, 2018.
3. **Jiandong Tian**, Zak Murez, Tong Cui, Zhen Zhang, David Kriegman, Ravi Ramamoorthi, "Depth and Image Restoration from Light Field in a Scattering Medium", *ICCV*, pp. 2401-2410, 2017.
4. Zhi Han, Guiping Shen, Siquan Yu, Naida Ding, **Jiandong Tian**, Yandong Tang, "Active Trace: A Sparse Spatiotemporal Representation for Videos", *IEEE Access*, Volume 5, Issue 1, pp. 22433-22422, 2017.
5. Weihong Ren, **Jiandong Tian***, Zhi Han, Yandong Tang, "Video Desnowing and Deraining Based on Matrix Decomposition", IEEE International Conference on Computer Vision and Pattern Recognition (CVPR), pp. 4210-4219, 2017.
6. Liangqiong Qu, **Jiandong Tian***, Shengfeng He, Yandong Tang, Rynson Lau, "DeshadowNet: A Multi-context Embedding Deep Network for Shadow Removal", IEEE

- International Conference on Computer Vision and Pattern Recognition (CVPR), 2017 (spotlight paper), pp. 4067-4075.
7. Weihong Ren, **Jiandong Tian***, Yandong Tang, "Specular Reflection Separation with Color-Lines Constraint", *IEEE Transactions on Image Processing*, Vol. 26, Issue 5, pp. 2327-2337, 2017.
 8. Liangqiong Qu, Shengfeng He, Jiawei Zhang, **Jiandong Tian**, Yandong Tang, and Qingxiong Yang, "RGBD Salient Object Detection via Deep Fusion", *IEEE Transactions on Image Processing*, Vol. 26, Issue 5, pp. 2274-2285, 2017.
 9. Zhi Han, **Jiandong Tian**, Liangqiong Qu, and Yandong Tang, "A New Intrinsic-Lighting Color Space for Daytime Outdoor Images", *IEEE Transactions on Image Processing*, Vol. 26, Issue 2, pp. 1031-1039, 2017.
 10. Tong Cui, **Jiandong Tian***, Yandong Tang, "Single Image Dehazing by Latent Region-Segmentation Based Transmission Estimation and Weighted L1-norm Regularization", *IET Image Processing*, Vol. 11, Issue 2, pp. 145-154, 2017.
 11. **Jiandong Tian**, Zhigang Duan, Weihong Ren, Zhi Han, Yandong Tang, "Simple and Effective Calculations about Spectral Power Distributions of Outdoor Light Sources for Computer Vision", *Optics Express*, Vol. 24, Issue 7, pp. 7266-7286, 2016.
 12. Weihong Ren, **Jiandong Tian***, Yandong Tang, "Blind Deconvolution with Non-local Similarity and l0 Sparsity for Noisy Image", *IEEE Signal Processing Letters*, Vol. 23, Issue 4, pp:439-443, 2016.
 13. **Jiandong Tian**, Xiaojun Qi, Liangqiong Qu, and Yandong Tang, "New Spectrum Ratio Properties and Features for Shadow Detection", *Pattern Recognition*, Volume 51, Issue 3, pp: 85-96, 2016.
 14. Liangqiong Qu, **Jiandong Tian**, Zhi Han, and Yandong Tang, "Pixel-wise Orthogonal Decomposition for Color Illumination Invariant and Shadow-free Image", *Optics Express*, Vol.23, Issue3, pp: 7266-7286, 2015.
 15. Denglu Wu, **Jiandong Tian***, Yandong Tang, Optimized basis function for spectral reflectance recovery from tristimulus values, *Optical Review*, Vol. 21, Issue 2, pp: 117-126, 2014.
 16. **Jiandong Tian** and Yandong Tang, Wavelength-sensitive-function controlled reflectance

reconstruction, *Optics Letters*, Vol. 38, Issue 15, pp. 2818-2820, 2013.

17. Denglu Wu, **Jiandong Tian***, Bingfeng Li, Yandong Tang, Recovering Sensor Spectral Sensitivity from Raw Data, *Journal of Electronic Imaging*, Vol. 22, Issue2, pp: 1-8, 2013.

18. **Jiandong Tian**, Linlin Zhu and Yandong Tang, Outdoor shadow detection by combining tricolor attenuation and intensity, *EURASIP Journal on Advances in Signal Processing*, Vol. 11, Issue 6, pp. 1-8, 2012.

19. **Jiandong Tian** and Yandong Tang, Linearity of each channel pixel values from a surface in and out of shadows and its applications, 24th IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2011: 985-992.

20. **Jiandong Tian**, Jing Sun, and Yandong Tang, Short-baseline binocular vision system for a humanoid ping-pong robot, *Journal of Intelligent and Robotic Systems*, Vol.64, Issue3, pp:643-560, 2011.

21. **Jiandong Tian**, Wei Dong, and Yandong Tang, Finding passable regions for robots from a single still image, *International journal of robotics and automation*, Vol. 24, Issue 3, pp. 228-234, 2009.

22. **Jiandong Tian** and Yandong Tang, Learning and vision based obstacle avoidance and navigation, Book: Robot Intelligence: An Advanced Knowledge Processing Approach, Book (Chapter), Springer-Verlag, 2010.

23. **Jiandong Tian**, Jing Sun, and Yandong Tang, Tricolor attenuation model for shadow detection, *IEEE Transactions on image processing*, Vol. 18, Issue 10, pp. 2355-2363, 2009.

24. Jing Sun, **Jiandong Tian**, Yingkui Du, Yandong Tang, Retinex Theory Based Shadow Detection and Removal in Single Outdoor Image, *Industrial Robot*, Vol. 36, Issue 3, pp: 263-269, 2009.

Research Grant (Role in project)

1. 2017.01-2020.12:” Multimode perception system for Tri-Co robots on complicated illuminations and weather”, (Grant Number: 91648118), **Principal Investigator**, National Natural Science Foundation of China, RMB: 680,000.

2. 2015.01-2018.12:” Illumination modeling and its invariant algorithms for computer vision”, (Grant Number: 61473280), **Principal Investigator**, National Natural Science Foundation of China, RMB: 800,000.
3. 2016.1-2018.12: “Deep learning and illumination processing for robots”, **Principal Investigator**, Siasun Robot & Automation Co.,Ltd., RMB: 800,000.
4. 2013.12-2016.12:” Illumination, Reflectance, and camera modeling”, (Grant Number: Y3A1065101), **Principal Investigator**, Chinese Academy of Sciences. RMB: 400, 000.
5. 2011.01-2013.12:” Physical and imaging properties of outdoor shadow and its removal methods”, (Grant Number: 61102116), **Principal Investigator**, National Natural Science Foundation of China, RMB: 280,000.
6. 2010.09-2014.09:” Image degradation modeling and processing by scattering”, (Grant Number: Y3A1204101), **Principal Investigator**, Open Research Fund of National Key Laboratory, RMB: 200,000.
7. 2008.5-2009.9: “Humanoid robot of high-performance modules and systems”, **Co-PI**, (National High Technology Research and Development Program of China (863 Program)), RMB: 850,000.

Honors and Awards

- [1] IEEE, Senior member.
- [2] Chinese Society for Optical Engineering (CSOE), Council member.
- [3] Chinese Optical Society (COS), Senior member.
- [4] Liaoning BaiQianWan Talents Program, second prize.
- [5] 2016, Academic award of nature science in Liaoning province, first prize.
- [6] 2015, Liaoning Prize for Progress in Science and Technology, second prize.
- [7] 2014, Youth Innovation Promotion Association Award, Chinese Academy of Sciences.
- [8] 2012, ZhuLiYueHua Prize, Chinese Academy of Sciences.
- [9] 2010, Academic award of nature science in Liaoning province, first prize.
- [10] 2009, Excellent Awards in Knowledge Innovation Program, Shenyang Institute of Automation, Chinese Academy of Sciences.

Professional Service

[1] Program Committee: CVPR 2018, SIGGRAPH 2018, ICIP 2018, WCICA 2018, ICIP 2017.

[2] Organizing Committee: CYBER 2015

[3] Technical Program Committee: CYBER 2016, CYBER 2018, IST 2018

[4] Reviewer: IEEE Transactions on Image Processing, IEEE Transactions on Industrial Informatics, IEEE Transactions on Systems, Man, and Cybernetics, Journal of the Optical Society of America A, Applied Optics, Computers & Graphics, and Remote Sensing.

[5] Evaluation expert: National Science & technology, China

[6] Evaluation expert: Major Research Plan (Tri-Co Robots) of the National Natural Science Foundation of China (NSFC).

Advisees

[1] Current Ph.D. students,

Liangqiong Qu, Weihong Ren, Tong Cui, and Yu Guan

[2] Current M.S. students,

Wei Huang and Zhen Zhang

[3] Alumni

Dr. Denglu Wu (Postdoc, National University of Singapore)

Dr. Zhigang Duan (Inspur Group Co., Ltd)

References

Available upon request.