GUANJUN TAN

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RESEARCH INTEREST

Optics for

- Virtual Reality and Augmented Reality display
- Organic LED display and lighting
- Liquid Crystal display and photonics

EDUCATION

Ph.D. in progress – Optics **08/2014 – Present**

Advisor: Prof. Shin-Tson Wu, GPA 3.98/4.0

CREOL, College of Optics and Photonics, University of Central Florida, Orlando, FL

B.S. – Physics **08/2010 – 06/2014**

Optical Information Science and Technology, GPA 3.93/4.30

Department of Physics, University of Science and Technology of China, Hefei, Anhui, China

PROFESSIONAL EXPERIENCE

Internship – Apple Inc. **07/2018 – 09/2018**

Display Optics

Research Assistant – University of Central Florida **01/2018 – Present**

Project coordinator of collaborative project with GoerTek

- Multi-resolution foveated imaging for near-eye display
- Diffractive optical elements for VR/AR display

Research Assistant – University of Central Florida **01/2018 – Present**

Project leader of collaborative project with AU Vista

- High dynamic range LCD with a mini-LED local dimming backlight
- Display image quality analysis for micro-LED
- Full-color solutions for micro-LED display

Research Assistant – University of Central Florida **01/2017 – Present**

Project coordinator of collaborative project with Intel

- Polarization-multiplexed multi-plane display

Research Assistant – University of Central Florida **01/2017 – 01/2018**

Project leader of collaborative project with ITRI (Taiwan)

- Optical element development for VR/AR display
- Optical simulation software package for OLED/QLED
- Mixed-level 3-D optical modeling for OLED/QLED
- Suppressing angular color shift for RGB OLED display

Research Assistant – University of Central Florida **09/2015 – 12/2017**

Project leader of collaborative project with AU Vista

- Electro-optical models for fast-response ULH and USH modes
- Viewing angle analyses of ULH and USH modes
- Compensation methods to widen viewing angle of ULH and USH
- Quantum-dot enhanced LC display

Research Assistant – University of Central Florida **08/2014 – 12/2016**

Project leader of collaborative project with ITRI (Taiwan)

- Circular-Polarizer-free flexible OLED/QLED display (patent issued)
- Broadband moth-eye anti-reflection film for flexible display

SKILL & SOFTWARE

Electromagnetic Simulation:

- Proficiency in mixed-level optical modeling combining Wave Optics and Ray Optics
- Proficiency in OLED/QLED optical simulation with MATLAB, COMSOL Multiphysics, FDTD solutions and RSoft
- Proficiency in metasurface optical simulation with COMSOL Multiphysics, FDTD solutions and RSoft

Liquid Crystal Simulation:

- Proficiency in LC electro-optical simulation with Techwiz LCD, DIMOS, COMSOL Multiphysics and MATLAB
- Proficiency in LC display system optical design with LightTools and MATLAB

Optical Design:

- Proficiency in optical thin-film coating design with TFCalc
- Working knowledge of optical system design with Zemax
- Working knowledge and experience in color science

Optical/Display Characterization & Assembly

- Electra and optical characterization of Liquid Crystal materials
- Optical characterization of Organic LED devices
- Hands-on experience with LC display system assembly and characterization
- Hands-on experience with near-eye display system setup and prototyping
- Hands-on experience with optical system assembly and setup
- Spin-coating, sputter coating and other basic clean room operations

Coding and other software:

- Code programming: MATLAB, Python, C, C++
- Working knowledge of LabVIEW and 3ds Max

HONOR & AWARD

UCF's Graduate Dean's Dissertation Completion Fellowship	12/2018
IEEE Orlando Chapter Graduate Student Scholarship Award	10/2018
Best Student Paper, ICDT Conference	05/2018
Distinguished Student Paper (co-author), SID International Symposium	05/2018
Student Travel Grant Award, SID International Symposium	05/2018
SPIE Optics and Photonics Education Scholarship	05/2018
Dr. Martin Schadt Best Paper Award, SLCP Conference	04/2018
JSID's Outstanding Student Paper of the Year Award (co-author)	06/2017
Student Travel Grant Award, SID International Symposium	05/2017
Distinguished Student Paper (co-author), SID International Symposium	05/2016
Student Travel Grant Award, SID International Symposium	05/2016
Graduate Dean's Fellowship, University of Central Florida	09/2014
CREOL Graduate Research Fellowship, University of Central Florida	09/2014
Outstanding Graduate Award, USTC	07/2014
National Encouragement Scholarship, USTC	10/2013
Outstanding Undergraduate Research Project, USTC	10/2013
First Prize of Undergraduate Mathematical Contest, Anhui, China	10/2012
Outstanding Student Leader, USTC	10/2012
Xing-Ye Scholarship, USTC	09/2012
National Scholarship (top 1%), USTC	09/2011
Outstanding Freshman Scholarship, USTC	09/2011

JOURNAL PUBLICATION

1. **G. Tan**, T. Zhan, Y. H. Lee, J. Xiong, and S. T. Wu, "Polarization-multiplexed Multiplane Display," Opt. Lett. **43**(22), 5651−5654 (2018).
2. **G. Tan**, Y. H. Lee, T. Zhan, J. Yang, S. Liu, D. F. Zhao, and S. T. Wu, "Foveated Imaging for Near-eye Displays," Opt. Express **26**(19), 25076-25085 (2018).
3. **G. Tan**, Y. Huang, M. C. Li, S. L. Lee, and S. T. Wu, "High Dynamic Range Liquid Crystal Displays with a Mini-LED Backlight," Opt. Express **26**(13), 16572-16584 (2018).
4. Y. H. Lee, **G. Tan**, K. Yin, T. Zhan, and S. T. Wu, "Compact See-through Near-eye Display with Depth Adaption," J. SID **26**(2), 64-70 (2018).
5. H. Chen, **G. Tan**, and S. T. Wu, "Ambient Contrast Ratio of LCDs and OLED Displays," Opt. Express **25**(26), 33643-33656 (2017).
6. **G. Tan**, J. H. Lee, S. C. Lin, R. Zhu, S. H. Choi, and S. T. Wu, "Analysis and Optimization on the Angular Color Shift of RGB OLED Displays," Opt. Express **25**(26), 33629-33642 (2017).
7. (**AIP news**) G. Liu, Y. H. Lee, Y. Huang, Z. Zhu, **G. Tan**, M. Q. Cai, P.-P. Li, D. Wang, Y. Li, S. Pang, C. Tu, S.T. Wu, and H.-T. Wang, "Dielectric Broadband Meta-vector-polarizers Based on Nematic Liquid Crystal," APL Photonics **2**, 126102 (2017).

8. (**Review paper**) **G. Tan**, Y. H. Lee, F. Gou, H. Chen, Y. Huang, Y. F. Lan, C. Y. Tsai, and S. T. Wu, "Review on Polymer-Stabilized Short-Pitch Cholesteric Liquid Crystal Displays," J. Phys. D: Appl. Phys. **50**, 493001 (2017).
9. (**Review paper**) Y. H. Lee, **G. Tan**, T. Zhan, Y. Weng, G. Liu, F. Gou, F. Peng, N. V. Tabiryan, S. Gauza, and S. T. Wu, "Recent Progress in Pancharatnam-Berry Phase Optical Elements and the Applications for Virtual/Augmented Realities," Optical Data Processing and Storage **3**, 79-88 (2017).
10. (**OSA news release**) **G. Tan**, J.-H. Lee, Y.-H. Lan, M.-K. Wei, L.-H. Peng, I-C. Cheng, and S. T. Wu, "Broadband Antireflection Film with Moth-Eye-Like Structure for Flexible Display Application," Optica **4**(7), 678-683 (2017).
11. H. Chen, **G. Tan**, M. C. Li, S. L. Lee, and S. T. Wu, "Depolarization Effect in Liquid Crystal Displays," Opt. Express **25**(10), 11315-11328 (2017).
12. **G. Tan**, Y. H. Lee, F. Gou, M. Hu, Y. F. Lan, C. Y. Tsai, and S. T. Wu, "Macroscopic Model for Analyzing the Electro-Optics of Uniform Lying Helix Cholesteric Liquid Crystals," J. Appl. Phys. **121**, 173102 (2017).
13. (**OSA news release**) Y. Huang, H. Chen, **G. Tan**, H. Tobata, S-I Yamamoto, E. Okabe, Y. F. Lan, C. Y. Tsai, and S. T. Wu, "Optimized Blue-Phase Liquid Crystal for Field-Sequential-Color Displays," Opt. Mater. Express **7**(2), 641-650 (2017).
14. H. Chen, R. Zhu, **G. Tan**, M. C. Li, S.-L. Lee, and S. T. Wu, "Enlarging the Color Gamut of Liquid Crystal Displays with a Functional Reflective Polarizer," Opt. Express **25**(1), 102-111 (2017).
15. H. Chen, **G. Tan**, Y. Huang, Y. Weng, T.-H. Choi, T.-H. Yoon, and S. T. Wu, "A Low Voltage Liquid Crystal Phase Grating with Switchable Diffraction Angles," Sci. Rept. **7**, 39923 (2017).
16. **G. Tan**, R. Zhu, Y. S. Tsai, K. C. Lee, Z. Luo, Y. Z. Lee, and S. T. Wu, "High Ambient Contrast Ratio OLED and QLED without a Circular Polarizer," J. Phys. D: Appl. Phys. **49**, 315101 (2016).
17. (**Outstanding student paper of the year**) R. Zhu, H. Chen, T. Kosa, P. Coutino, **G. Tan**, and S. T. Wu, "High-ambient-contrast Augmented Reality with a Tunable Transmittance Liquid Crystal Film and a Functional Reflective Polarizer," J. SID **24**(4), 229-233 (2016).
18. R. Zhu, **G. Tan**, J. Yuan, and S. T. Wu, "Functional Reflective Polarizer for Augmented Reality and Color Vision Deficiency," Opt. Express **24**(5), 5431-5441 (2016).
19. D. Xu, F. Peng, **G. Tan**, J. He, and S. T. Wu, "A Semi-empirical Equation for the Response Time of In-Plane Switching Liquid Crystal Display and Measurement of Twist Elastic Constant," J. Appl. Phys. **117**, 203103 (2015).
20. J. Yuan, **G. Tan**, D. Xu, F. Peng, A. Lorenz, and S. T. Wu, "Low-voltage and Fast-response Polymer-stabilized Hyper-Twisted Nematic Liquid Crystal," Opt. Mater. Express **5**, 1339-1347 (2015).
21. D. Xu, **G. Tan**, and S. T. Wu, "Large-angle and High-efficiency Tunable Phase Grating Using Fringe Field Switching Liquid Crystal," Opt. Express **23**, 12274-12285 (2015).

Issued Patent

1. Y. H. Lee, T. Zhan, **G. Tan**, F. Gou, F. Peng, S. T. Wu, "Optical Display System with Enhanced Resolution, Methods, and Applications," US Patent 10,115,327 B1 (Oct. 30, 2018).
2. Y.-S. Tsai, K.-C. Lee, S. T. Wu, **G. Tan**, R. Zhu, "Display Device and Optical Film," US Patent 9,680,132 B1 (June 13, 2017).

Conference Proceeding

1. **G. Tan**, H. Chen, Y. F. Lan, C. Y. Tsai, and S. T. Wu, "Wide-view and Fast-response Uniform Standing Helix Cholesteric LCD," SID Symp. Digest **49**(1), 1769-1772 (May 2018).
2. H. Chen, **G. Tan**, M. C. Li, S. L. Lee, and S. T. Wu, "High Contrast Ratio LCD with an In-cell Polarizer," SID Symp. Digest **49**(1), 1734-1737 (May 2018).
3. (**Distinguished student paper**) Y. H. Lee, **G. Tan**, K. Yin, T. Zhan, and S. T. Wu, "Compact See-through Near-eye Display with Depth Adaption," SID Symp. Digest **49**(1), 1060-1063 (May 2018).
4. (**Invited Paper**) H. Chen, **G. Tan**, and S. T. Wu, "Can LCDs Outperform OLED Displays in Ambient Contrast Ratio?" SID Symp. Digest **49**(1), 981-984 (May 2018).
5. **G. Tan**, J. H. Lee, S. C. Lin, R. Zhu, S. H. Choi, and S. T. Wu, "Systematic Optimization for Achieving Indistinguishable Color Shift of RGB OLED Displays," SID Symp. Digest **49**(1), 418-421 (May 2018).
6. C. Zhang, J. He, H. Chen, **G. Tan**, L. Zhou, S. T. Wu, Y. Sohn, and Y. Dong, "Converting Light Diffusing Polymer Powders into Stable Perovskite-based Tunable Downconverters," SID Symp. Digest **49**(1), 222-224 (May 2018).
7. **G. Tan**, Y. H. Lan, M. K. Wei, L. H. Peng, I. C. Cheng, S. T. Wu, and J. H. Lee. "Antireflection and Self-cleaning Film with Moth-eye-like Structure for Mobile Flexible Displays," Proc. SPIE, Advances in Display Technologies VIII, **1055608** (March 2018).
8. F. Gou, Y. H. Lee, **G. Tan**, M. Hu, Y.-F. Lan, C.-Y. Tsai, and S. T. Wu, "Submillisecond Grayscale Response Time of a Uniform Lying Helix Liquid Crystal," SID Symp. Digest **48**(1), 1822-1825 (May 2017).

9. **G. Tan**, Y. H. Lee, F. Gou, M. Hu, Y.-F. Lan, C.-Y. Tsai, and S. T. Wu, "Figure of Merit for Optimizing the Performance of Uniform Lying Helix Cholesteric Liquid Crystals," SID Symp. Digest **48**(1), 490-493 (May 2017).
10. Y. Huang, H. Chen, **G. Tan**, H. Tobata, S. Yamamoto, E. Okabe, Y.-F. Lan, C.-Y. Tsai, and S. T. Wu, "New Blue Phase Liquid Crystal Optimized for Color-Sequential Displays," SID Symp. Digest **48**(1), 486-489 (May 2017).
11. G. Tan, J.-H. Lee, Y.-H. Lan, M.-K. Wei, L.-H. Peng, I Cheng, and S. T. Wu, "Moth-eye Anti-reflection Surface for Sunlight Readable Flexible Displays," SID Symp. Digest **48**(1), 574-577 (May 2017).
12. H. Chen, R. Zhu, **G. Tan**, M.-C. Li, S.-L. Lee, and S. T. Wu, "Wide-color-gamut LCD with a Functional Reflective Polarizer," SID Symp. Digest **48**(1), 1659-1662 (May 2017).
13. Y. H. Lee, **G. Tan**, Y. Weng, and S. T. Wu, "Switchable Lens Based on Cycloidal Diffractive Waveplate for AR and VR Applications," SID Symp. Digest **48**(1), 1061-1064 (May 2017).
14. **G. Tan**, R. Zhu, Y. S. Tsai, K. C. Lee, Z. Luo, Y. Z. Lee, and S. T. Wu, "High Ambient Contrast Ratio OLED and Quantum-dot LED without a Circular Polarizer," SID Symp. Digest **47**, 1509-1512 (May 2016).
15. (**Distinguished student paper**) R. Zhu, H. Chen, **G. Tan**, T. Kosa, P. Coutino, and S. T. Wu, "A High-ambient-contrast Augmented Reality System," SID Symp. Digest **47**, 1025-1028 (May 2016).
16. D. Xu, **G. Tan** and S. T. Wu, "Multi-angle Beam Steering for Head-Mounted Displays," SID Symp. Digest **47**, 1826-1829 (May 2016).

MEDIA COVERAGE

1. "Advance in Light Filtering Technology Has Implications for LCD Screens, Lasers and Beyond," *AIP News*, 13 December 2017.
2. "Learning from Nature: Moth Eyes Inspire Non-reflective Screen Coating," *Scientific American*, 26 July 2017.
3. "Moths Help Scientists Attack Glare," *The Wall Street Journal*, 07 July 2017.
4. "A Better Touch Screen, Inspired by Moth Eyes," *Discover Magazine*, 22 June 2017.
5. "Eyes Inspire Glare-Resistant Coating for Cellphone Screens," *National Public Radio*, 22 June 2017.
6. "New Screen Coating Makes Reading in Sunlight a Lot Easier. The Secret? Moth Eyes," *OSA News Release*, 22 June 2017.
7. "Novel Liquid Crystal Could Triple Sharpness of Today's Televisions," *OSA News Release*, 01 February 2017.

LEADERSHIP & SERVICE

Board Member & Secretary, CREOL Association of Optics Students (CAOS), UCF	09/2016 – 09/2017
Vice president, Society of Information Display Student Branch, UCF	09/2016 – 09/2017
Secretary, IEEE Photonics Society Student Chapter, UCF	09/2015 – 09/2016
Treasurer, Chinese Students and Scholars Association, UCF	04/2015 – 09/2016
Webmaster, Society of Information Display Student Branch, UCF	09/2014 – 09/2015

JOURNAL REVIEWER

· Optics Express · Optics Letters · Photonics Research · Journal of Physics D: Applied Physics · IEEE Photonics · Journal of Society of Information Display · ACS Applied Nano Materials · AIP Advances · Journal of Luminescence (~ 40 times review experience)