

Curriculum Vitae

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■ Education:

Ph.D., Electro-Optical Engineering, NCTU, Taiwan 2003.
Bachelor of Electrical and Computer Engineering, NCTU, Taiwan 1997.

■ Academic Experience:

09/2014~ Professor in NCTU, Taiwan.
09/2008~08/2014 Associate Professor in NCTU, Taiwan.
08/2004~08/2008 Assistant Professor in NCTU, Taiwan.
02/2013~01/2014 Visiting Scholar in Harvard University, Boston, U.S.A.
05/2003~07/2004 Post-doctoral Fellow in Carnegie Mellon University, Pittsburgh, U.S.A.
02/2001~08/2001 Researching Assistant in University of Arizona, Tucson, U.S.A.

■ Research Activities:

Deep neural network for coded mask cryptographical imaging

We proposed a novel cryptographic imaging scheme that is the combination of optical encryption and computational decryption. To prevent personal privacy from being spied upon amid the imaging formation process, in this study we applied a coded mask to optically encrypt the scene and utilized the deep neural

network for computational decryption. For encryption, the sensor recorded a new representation of the original signal, not being distinguishable by humans on purpose. For decryption, we successfully reconstructed the image with the mean squared error equal to 0.028, and 100% for the classification through the Japanese Female Facial Expression dataset. By means of the feature visualization, we found that the coded mask served as a linear operator to synthesize the spatial fidelity of the original scene, but kept the features for the post-recognition process. We believe the proposed framework can inspire more possibilities for the unconventional imaging system.

Colorimetric Computation for Intelligence Lighting and Spectral Imaging

LEDs have changed the concept of illumination not only in an expectation of the highest electro-luminance efficiency but also in tremendous chances for smart lighting applications. With a cluster mixing, many studies were addressed to strategically manipulate the chromaticity point, system efficiency and color rendering performance according to different operational purposes, called smart lighting. In this study, we developed a methodology analogous to a general lens design rule to optimize the spectral power distribution of a white-light LED cluster with the highest possible color rendering and efficiency in a defined range of color temperatures. Based on a homemade spectrally and temporally programmable light engine associated with computational processing, we enable any spectral profile for the uses in spectroscopy, microscopy, and endoscopy.

Computational Optics for Unconventional Imaging System

Computational imaging systems are novel scheme composed of generalized imaging optics and post signal processing capability. The unique characteristics of computational optics are useful to advantage in many applications, e.g. iris image on move. A major difficulty in current iris recognition system is a very shallow depth-of-field that limits system usability. Such constraint results in the blur of the captured iris images, which in turn, lead to the degradation of iris recognition accuracy. In this study, we propose a novel telescopic layout jointed with free-form phase wavefront encoding to offer a significant stand-off iris image acquisition distance (over 3m). The new approach can greatly increase the depth-of-field over that possible with traditional optics, while keeping sufficient recognition accuracy. From the perspective of pattern recognition, we should take consideration of the gallery image set with the most amounts of possible variations. Many works with pattern recognition and machine learning will be one

of the future research directions.

■ Courses and Teaching Award:

Undergraduate:

Linear algebra;

Optical design, fabrication, testing and measurement;

Introduction to Math software;

Service learning (social activities for community)

Graduate:

Fourier optics;

Display optics

2009, 2010 Tin-Ka-Pin Excellence Teaching Award, NCTU.

2010 Excellence Teaching Award, College of ECE, NCTU

2009 Outstanding Student Mentor of Department of Photonics, NCTU

2011 Outstanding Student Mentor of EECS Undergraduate Honor Program, NCTU

International recognition, activity and awards:

- NCTU Academic achievement award, 1996, 1997 (Bachelor); 1998, 1999 (Graduate school).
- PHOENIXTEC Scholarship (awarded to top 1 per year), 1996.
- Phi Tau Phi Scholastic Honor (awarded to top 1 graduate per class), 1997.

- IEEE, OSA, SID Member.
- International Symposium on Optical Memory (ISOM) Technical Program Committee.
- International Conference on Display LEDs (ICDL) International Advisory Committee.
- International Conference on Optics-photonics Design and Fabrication (ODF) Program Committee.
- Microoptics Conference (MOC) Program Committee
- The Fourth Asia-Pacific Light Sources Workshop Program Committee
- International Conference on Advanced Manufacture (ICAM) Technical Program

Committee.

- (Invited talk) Chung-Hao Tien, "C-shaped Transducer for Optical Near Field Recording" Workshop on Global perspectives in Frontiers of Photonics, Duke University, Durham, USA (2005).
- (Invited talk) Chung-Hao Tien, "Dual-probe Fiber Head for Near-Field Optical Recording" CSIC-NSC Workshop on Photonics, National Chiao Tung University, Taiwan (2007).
- (Invited talk) Chung-Hao Tien, "Luminescent efficiency enhancement of polymer light-emitting diodes using solution-processible metal nanoparticles incorporated nanocomposites" IMID/IDMC/ASIA DISPLAY, Korea (2010).
- (Invited talk) Chung-Hao Tien, "How to smart a LED-based Lighting system?" IPC International Photonics Conference, Tainan, Taiwan (2011).
- (Invited talk) Chung-Hao Tien, "Smart lighting by a LED-based Lighting system" IWSSLHF, Taoyuan, Taiwan (2012).
- (Invited talk) Chung-Hao Tien, "Computational Lighting by a LED-based cluster system" SPIE Optics + Photonics, San Diego, USA (2012).
- Referee of Optics Express, Applied optics, Optics Letters, IEEE Photonics Technology Letters, IEEE/OSA Journal of Display Technology, Journal of Nanoscience and Nanotechnology, Signal Processing, Journal of Society for Information Display etc.

- International Symposium on Optical Memory (ISOM) 2004 Excellent Paper Award: "C-shaped Aperture for Near-field Recording", Jeju Island, Korea.
- Asia-Pacific Data Storage Conference 2006 Outstanding Poster Award.
- Taiwan Information Storage Association (TISA) 2007 Best PhD Thesis
- Taiwan Information Storage Association (TISA) 2007: Best Master Thesis
- Optical Photonics Taiwan (OPT) 2006, 2007, 2009, 2011 Best Student Award
- International Conference on Advanced Manufacture (ICAM) 2010: Best Paper Award

- NSC 3-year Young Fellowship Award (2013~2016)
- NSC 1-year Overseas Travel Grant (2013~2014) visit Harvard University

Publication (selected) *Corresponding author

Journal

1. Ya-Ti Chang Lee*, Yi-Chun Fang, **Chung-Hao Tien**, "Deep neural network for coded mask cryptographical imaging," *Applied Optics* (60), 1686-1693 (2021).
2. Jian-Jia Su* and **Chung-Hao Tien**, "Improved Error Reduction and Hybrid Input Output Algorithms for Phase Retrieval by including a Sparse Dictionary Learning-Based Inpainting Method," *International Journal of Optics*, Volume 2020, 3481830 (2020).
3. Hsiu-Wen Cheng, Tsung-Lin Chen and **Chung-Hao Tien***, "Learning-based risk assessment and motion estimation by vision for unmanned aerial vehicle landing in an unvisited area," *J. of Electronic Imaging*, 28(6), 063011 (2019).
4. Hsiu-Wen Cheng, Tsung-Lin Chen and **Chung-Hao Tien***, "Motion Estimation by Hybrid Optical Flow Technology for UAV Landing in an Unvisited Area," *Sensors*, 19(6), 1380 (2019).
5. Jian-Jia Sua, **Chung-Hao Tien**, Yu-Lin Tsai, Chin-Tien Wu*, "A skew freeform reflector design method for prescribed off-axis irradiance," *Results in Physics*, Volume 13, 102193 (2019).
6. Jie-En Li and **Chung-Hao Tien***, "Fundus photography with subpixel registration of correlated laser speckle images," *Jpn. J. Appl. Phys.*, 57, 09SB01 (2018).
7. Sheng-Hsun Hsieh, Yung-Hui Li , Wei Wang, **Chung-Hao Tien***, "A Novel Anti-Spoofing Solution for Iris Recognition Toward Cosmetic Contact Lens Attack Using Spectral ICA Analysis." *Sensors*, Vol. 18, No. 3, 795(2018).
8. Jie-En Li* and **Chung-Hao Tien**, "The study of pixelated sampling and its influences on the 2nd-order spatial coherence measurement," *Opt. Commun.* 423, 86 (2018).
9. Sheng-Hsun Hsieh, Yung-Hui Li *, **Chung-Hao Tien**, "Test of the Practicality and Feasibility of EDoF-Empowered Image Sensors for Long-Range Biometrics," *Sensors*, accepted (2016).
10. Sheng-Hsun Hsieh, Yung-Hui Li, **Chung-Hao Tien**, and Chin-Chen Chang, "Extending the Capture Volume of an Iris Recognition System Using Wavefront Coding and Super-Resolution," *IEEE Transaction on Cybernetics*, VOL. 46, NO. 12, 3342-3350 (2016).
11. Yu-Lin Tsai and **Chung-Hao Tien**, "Approach to analytically minimize the LCD moiré by image-based particle swarm optimization," *Applied Optics* , Vol. 54, No. 28 E41-E46 (2015)
12. Pi-Ju Cheng, **Chung-Hao Tien**, and Shu-Wei Chang*, "Incomplete immunity to backscattering in chiral one-way photonic crystals," *Optics Express*, Vol. 23, Issue 8,

pp. 10327-10340 (2015).

13. Yu-Lin Tsai, Ming-Chen Chiang, Ray Chang, **Chung-Hao Tien***, Chin-Tien Wu, "A new approach to construct freeform surface by numerically differential formulation," *Optical Engineering*, Vol. 53, Issue 3, pp. 031307 1-6 (2014).
14. Pi-Ju Cheng, Chen-Ya Weng, Shu-Wei Chang, Tzy-Rong Lin*, **Chung-Hao Tien**, "Plasmonic gap-mode nanocavities with metallic mirrors in high-index cladding", *Optics Express*, Vol. 21, 13479-13491 (2013)
15. Yen-Hsing Lu and **Chung-Hao Tien***, "Principal Component Analysis of Multi-Pigment Scenario in Full-Color Electrophoretic Display," *IEEE/OSA J. Display Technology*, Vol. 9, 807-813 (2013).
16. Pi-Ju Cheng, Chen-Ya Weng, Shu-Wei Chang, Tzy-Rong Lin* and **Chung-Hao Tien**, "Cladding Effect on Hybrid Plasmonic Nanowire Cavity at Telecommunication Wavelengths," *IEEE Journal of Selected Topics in Quantum Electronics*, Vol. 19, Issue: 3, 4800306 (2013).
17. Rakesh Singh Moirangthem, Pi-Ju Cheng, Paul Ching-Hang Chien, Buu Trong Huynh Ngo, Shu-Wei Chang, **Chung-Hao Tien**, and Yia-Chung Chang*, "Optical cavity modes of a single crystalline zinc oxide microsphere," *Optics Express*, 21 3010-3020 (2013).
18. Ming-Chin Chien and **Chung-Hao Tien***, "Computational lighting by an LED-based cluster system," *SPIE Newsroom* 10.1117/2.1201209.004460 (2012).
19. Ming-Chin Chien and **Chung-Hao Tien***, "Multispectral mixing scheme for LEDs cluster with extended temperature-operable window," *Optics Express*, 20 A245-254 (2012).
20. Min Gu, Xiangping Li, Tzu-Hsiang Lan and Chung-Hao Tien, "Plasmonic keys for ultra-secure information encryption," *SPIE Newsroom* 10.1117/2.1201211.004538 (2012).
21. Xiangping Li, Tzu-Hsiang Lan, **Chung-Hao Tien** and Min Gu*, "Three-dimensional orientation-unlimited polarisation encryption by a single optically configured vectorial beam," *Nature Communications*, DOI: 10.1038/ncomms2006 (2012).
22. Tzu-Hsiang Lan, Yi-Kuan Chung, Jie-En Li and **Chung-Hao Tien*** "Plasmonic rainbow rings induced by white radial polarization," *Optics Letters*, 37 1205-1207 (2012).
23. Tzu-Hsiang Lan, Chen-Yeh Ho and **Chung-Hao Tien***, "Direct measurement of versatile surface plasmon polaritons excited by split polarization," *Applied Physics Letters*, 98, 081107 (2011).

24. Ming-Chin Chien and **Chung-Hao Tien***, "Cluster LEDs mixing optimization by lens design techniques," Optics Express, Vol. 19, No. S4, pp. A804-817 (2011).
25. Tzu-Hsiang Lan, Yi-Kuan Chung, and **Chung-Hao Tien***, "Broad Detecting Range of Objective-Based Surface Plasmon Resonance Sensor via Multilayer Structure," Jpn. J. Appl. Phys., Vol. 50, 09MG04, (2011).
26. Y-L Chen, C-C Chang, L. Angot, C-W Chang, and **Chung-Hao Tien***, "single- shot depth-camera design," SPIE Newsroom, 10.1117/2.1201010.003277. (2010).
27. Tzu-Hsiang Lan and **Chung-Hao Tien***, "Manipulation of the Steering and Shaping of SPPs via Spatially Inhomogeneous Polarized Illumination," Optics Express, Vol. 18, No. 22, pp. 23314-23323 (2010).
28. Chien-Hsiang Hung and **Chung-Hao Tien***, "Phosphor-converted LED modeling by bidirectional photometric data," Optics Express, Vol. 18, No. 103, pp. A261-271 (2010).
29. Ming-Chin Chien, Yu Lung Tung, and **Chung-Hao Tien***, "Ultracompact backlight-reversed concentration optics," Applied Optics, Vol. 48, Issue 21, pp. 4142-4148 (2009).
30. **Chung-Hao Tien*** and Chien-Hsiang Hung, "An iterative model of diffuse illumination from bidirectional photometric data," Optics Express, Vol. 17, No. 2, pp. 723-732 (2009).
31. **Chung-Hao Tien***, Chien-Hsiang Hung and Tsung-Han Yu, "Microlens Arrays by Direct Write Ink-Jet Printing for LCD Backlighting Applications," IEEE/OSA J. Display Technology, vol. 5, issue 5, pp. 147-151, May (2009).
32. Yu-Kuo Cheng*, Yen-Hsing Lu, **Chung-Hao Tien** and Han-Ping D. Shieh, "Design and Evaluation of Light Spread Function for Area-adaptive LCD system," IEEE/OSA J. Display Technology, vol. 5, issue 2, pp. 66-71, Feb. (2009).
33. **Chung-Hao Tien***, Yen-Hsing Lu, and Yuan-Jung Yao, "Tandem Light-Guides With Micro-Line-Prism Arrays for Field-Sequential-Color Scanning Backlight Module," IEEE/OSA J. Display Technology, Vol. 4, No. 2, p. 147-152 (2008).
34. Yung-Sung Lan* and **Chung-Hao Tien**, "Design of Catadioptric Lens with Servo Optical Mechanism in Holographic Recording System," Jpn. J. Appl. Phys., 47, p. 5794-5796 (2008).
35. Tzu-Hsiang Lan* and **Chung-Hao Tien**, "Study on Focusing Mechanism of Radial Polarization with Immersion Objective," Jpn. J. Appl. Phys., 47, p. 5806-5808 (2008).
36. Yu-Nan Pao*, Po-Hung Yao, Yi-Ting Sun and **Chung-Hao Tien**, "Package for Side Emitting LED," Key Engineering Materials., 364, p. 148-151 (2008).

37. Yung-Sung Lan* and **Chung-Hao Tien**, "Innovative Three-Axial Actuator for High-Density Optical Drive," IEEE Trans. Magn., Vol. 43, No. 12, p. 4102-4105 (2007).

38. Jen-Yu Fang*, **Chung-Hao Tien**, Philipp Herget, James A. Bain, T.E. Schlesinger and Han-Ping D. Shieh, "Optical Feedback Height Control System Using Laser Diode Sensor for Near-Field Data Storage Applications," IEEE/OSA J. Lightwave Technol., vol.25, No.12, pp. 3704-3709 (2007).

39. Jen-Yu Fang*, **Chung-Hao Tien**, and Han-Ping D. Shieh, "Hybrid-effect transmission enhancement induced by oblique illumination in nano-ridge waveguide," Optics Express, Vol. 15, No. 18 , p. 11741-11749 (2007).

40. Jen-Yu Fang*, **Chung-Hao Tien**, and Han-Ping D. Shieh, "Dual-probe near-field fiber head with gap servo control for data storage applications," Optics Express, Vol. 15, No. 22, p. 14619-14628 (2007).

41. **C. H. Tien***, C. H. Hung, "Micromachined Polarization Beam Splitter With Adjustable Leak Ratio for Optical Pickup," IEEE/OSA Photon. Technol. Lett., Vol. 19, No. 15, p. 1109-1111 (2007).

42. T. H. Lan*, **C. H. Tien**, "Servo study of radially polarized beam in high numerical aperture optical data storage system," Jpn. J. Appl. Phys., Vol. 46, No. 6B, pp. 3758-3760 (2007).

43. Y. S. Lan*, **C. H. Tien**, "Hybrid catadioptric system for holographic and disk application," Jpn. J. Appl. Phys., Vol. 46, No. 6B, pp. 3867-3869 (2007).

44. **C.H. Tien***, C.H. Hung, C.H. Lee, "Aberrations measurement of fiber-end microlens by free-space microoptical ronchi interferometer," IEEE/OSA Photon. Technol. Lett., Vol. 18, No. 16, p.1768-1770 (2006).

45. Yu-Chieh Chen*, Jen-Yu Fang, **Chung-Hao Tien**, and Han-Ping D. Shieh, "High-transmission hybrid-effect-assisted nanoaperture," Optics Letter, Vol. 31, No. 5, p.655-657 (2006).

46. Yu-Chieh Chen*, Jen-Yu Fang, **Chung-Hao Tien** and Han-Ping D. Shieh, "Double-Corrugated C-Shaped Aperture for Near-Field Recording," Jpn. J. Appl. Phys., Vol. 45, No. 2B, pp. 1348-1350 (2006).

47. **Chung-Hao Tien*** and Chi-Hung Lee, "Optical Properties of surface micromachining with randomly distributed etch holes," Jpn. J. Appl. Phys., Vol. 45, No. 2A, pp. 1015-1017 (2006).

International Conference Papers (selected)

1. Hong, Xuan-En, et al. "Computational Ghost Image via Controlling Pseudothermal Light Source," 24th Microoptics Conference, Japan (2019).
2. Chia-Chi Yang, et.al., "Accessing refractive errors via eccentric infrared photorefraction based on deep learning," SPIE Future Sensing Technologies, Japan (2019).
3. Chih-Yu Chu, et.al., "Automatic organic light-emitting diode display mura detection model based on human visual perception and multi-resolution," SPIE Future Sensing Technologies, Japan (2019).
4. Yun-Zhen Yao, et.al., "Recovery of phase modulation via residual neural network," SPIE Future Sensing Technologies, Japan (2019).
5. Jie-En Li et al., "Measurement of 2nd-order phenomenon with spatial light modulator," SPIE Optical Systems Design, Germany (2018).
6. Jie-En Li et al., "Long working distance fundus photography with correlated laser speckle, International Symposium on Imaging, Sensing, and Optical Memory Japan (2017).
7. Hao-Ping Ku et al., "Measurement of wavefield correlation with spatial light modulator," International Symposium on Imaging, Sensing, and Optical Memory Japan (2017).
8. Jian-Jia Su, "Skew Freeform Reflectors for Two-Dimensional Illuminance," 2017 Frontiers in Optics (FiO)/Laser Science: The Optical Society of America (OSA) Annual meeting, Denver, USA (2017).
9. Meng-Chieh Lin, Wan-Hsueh Lai, Chung-Hao Tien, "Characterization of Retinal Blood Vessel by Laser Speckle Correlation Time Constant," SPIE Optics and Photonics, San Diego, USA (2016).
10. Jie-En Li, Jhih-Syuan Fu, Ming-Shu Hsiao, and Chung-Hao Tien, "Experimental method of optical coherence characterization in phase-space measurement," 2015 SPIE Optical Systems Design, Jena, Germany (2015).
11. Chung-Hao Tien, "EDoF System for Long Distance Iris Acquisition," Workshop of Information Optics, Kyoto, Japan (2015).
12. Yung-Hui Li, Bo-Ren Zheng, Dai-Yan Ji and Chung-Hao Tien, "Heterogeneous Iris

image hallucination using sparse representation on a learned heterogeneous patch dictionary" SPIE Optics & Photonics, San Diego, USA (2014).

- 13. Meng-Chieh Lin and Chung-Hao Tien, "Spectral image reconstruction by a tunable LED illumination," SPIE Optics & Photonics, San Diego, USA (2013).
- 14. Sheng-Hsun Hsieh, Zih-Hao Lian, Chong-Min Chang and Chung-Hao Tien, "The Influence of Phase Mask Position upon EDoF System," SPIE Optics & Photonics, San Diego, USA (2013).
- 15. Yen-Hsing Lu, Yu-Hsun Chiu and Chung-Hao Tien, "Using Independent Component Analysis for Colorant Estimation in Electrophoretic Display, SID 2013, Vancouver, Canada (2013).
- 16. Chung-Hao Tien, "Principal Component Analysis and Its Application to E-paper Characterization," IDMC2013, Taipei, Taiwan (2013).
- 17. Yu-Lin Tsai, Chin-Tien Wu and Chung-Hao Tien, "An approach to construct freeform surface by solving Monge-Ampere equation," OSA Optical Instrumentation for Energy and Environmental Applications 2013, Tucson, USA (2013).
- 18. Yung-Lin Chen, Sheng-Hsun Hsieh, Kuo-En Hung, Shi-Wen Yang, Yung-Hui Li, Chung-Hao Tien, " Extended depth of field system for long distance iris acquisition," SPIE Optics and Photonics, San Diego, USA (2012).
- 19. Ming-Chin Chien and Chung-Hao Tien, "Computational Lighting by a LED-based System," SPIE Optics and Photonics, San Diego, USA (2012).
- 20. Ming-Chin Chien and Chung-Hao Tien, "Multispectral optimization for cluster LEDs with wide operable range," SID2012, Boston, USA (2012).
- 21. Yen-Hsing Lu and Chung-Hao Tien, " Principal Component Analysis on Characterizing Full-Color Electrophoretic Display," SID2012, Boston, USA (2012).
- 22. Song-Bor Chiang, Ming-Chin Chien and Chung-Hao Tien, " Multispectral mixing scheme for smart LED-based lighting," SPIE Photonics West, San Francisco (2012).
- 23. Yen-Hsing Lu and Chung-Hao Tien, "Colorimetric Characterization of Monochromatic Microcup® Electrophoretic Display," SID2011, LA, USA (2011).
- 24. Ming-Chin Chien and Chung-Hao Tien, "Multi-objective optimization scheme for cluster solid-state lighting," SID2011, LA, USA (2011).
- 25. Tzu-Pin Lin, Kai-Ting Hu , Chia-Lin Liu and Chung-Hao Tien "The Optimal RGB LED Driving Scheme for Color Sequential LCD," IDW2010, Fukuoka, Japan (2010).

26. Tzu-Hsiang Lan, Yi-Kuan Chung and Chung-Hao Tien "Extending the Sensing Range of Refractive Index for Radial Polarization Enabling Wide-Field SPR Sensor," ISOM2010, Hualien, Taiwan (2010).
27. Chien-Hsiang Hung and Chung-Hao Tien "Phosphor Modeling for Phosphor-converted LEDs," SID2010, Seattle, USA (2010).
28. Ming-Chin Chien, Hsiao-Ju Chen, Yu-Lung Tung and Chung-Hao Tien "Optimal Additive Mixing Approach via Multi-Color LEDs Platform," SID2010, Seattle, USA (2010).
29. Yen-Hsing Lu, Chia-Hao Li, Jih-Fon Huang and Chung-Hao Tien "Evaluating Procedure of Color-Rendering Property on Reflective LCDs," SID2010, Seattle, USA (2010).
30. Pi-Ju Cheng, Hung-Min Shih, Jung-An Cheng, Chain-Shu Hsu and Chung-Hao Tien "Luminescent efficiency enhancement of polymer light-emitting diodes using solution-processible metal nanoparticles incorporated nanocomposites," SID2010, Seattle, USA (2010).
31. Tzu-Hsiang Lan, Jan-Ya He, and Chung-Hao Tien "Versatile Excitation of Localized Surface Plasmon Polaritons via Spatially Modulated Polarized Focus," CLEO2010, San Jose, USA (2010).
32. Chung-Hao Tien, Chien-Hsiang Hung, Bo-Wen Xiao, Hsin-Tao Huang, Yi-Pai Huang, and Chuang-Chuang Tsai, "Planar Lighting by Blue LEDs Array with Remote Phosphor," SPIE Photonic West 2010, San Francisco, USA (2010).
33. Chien-Hsiang Hung and Chung-Hao Tien "Modeling Diffuse Components by Bidirectional Scatter Distribution Function for LCD Applications," SID2009, Texas, USA (2009).
34. Pi-Ju Cheng, Jung-An Cheng, Zong-Wei Lin, Chung-Hao Tien, "Surface plasmon mediated luminescent enhancement of polymer light emitting diodes using dual-functional hole injection layer," SID2009, Texas, USA (2009).
35. Tzu-Hsiang Lan and Chung-Hao Tien "Interfering SPR Sensor with Radial Polarization," OSA Frontiers in Optics 2009, San Jose, USA (2009).
36. Yu-Kuo Cheng, Yen-Hsing Lu, Po-I Lu, Chung-Hao Tien and Han-Ping D. Shieh, "Super-Gaussian Light Spread Function for High- Dynamic-Range Displays," SID2008, Los Angeles, CA, USA (2008).
37. Yen-Hsing Lu, Yuan-Jung Yao, Jen-Chang Hsiao and Chung-Hao Tien, "Tandem Light Guides with Micro Line-Prism Arrays for Scanning FSC-LCDs," SID2008, Los Angeles, CA, USA (2008)

38. Chien-Hsiang Hung, Tsung-Han Yu, Jung-An Cheng, Chi-Hsien Chang, Yi-Hau Hsiau, Chung-Hao Tien, Tsung-Yang Li, and Chi-Neng Mo, "Microlens Array by Ink-Jet Technology for LCD Backlight Applications" SID2008, Los Angeles, CA, USA (2008).
39. Hsin-Tao Huang, Chein-Hsiang Hung, Yi-Pai Huang, Chung-Hao Tien, C.C. Tsai, Han-Ping D. Shieh, Jeremy Lin, Jerry Chen, Patrick Chen, and Win-Chi Chang, "UV-Excited Flat Lighting (UFL) System for LCD-TV Backlight Application," SID2008, Los Angeles, CA, USA (2008).
40. Tzu-Hsiang Lan and Chung-Hao Tien, "Subwavelength Focus by Radial Polarization through Metallic Thin Film with Annular Illumination," ISOM08, Hawaii, USA (2008).
41. Shun-Ting Hsiao, Po-Hung Yao and Chung-Hao Tien, "High Gain Diffuser Film with Surface Relief of 2D Paraboloidal Lens Array," IDW07, FMCP-29, Sapporo, Japan (2007).
42. Tzu-Hsiang Lan, and Chung-Hao Tien, "Study on Focusing Mechanism of Radial Polarization in Immersion Lens," ISOM07, We-J-26, Singapore (2007).
43. Yuan-Jung Yao, Yen-Hsing Lu, and Chung-Hao Tien, "Tandem Light-Guide with Prismatic Micro-Bumps Structures for Field-Sequential-Color Scanning Backlight Module," IDMC07, Fri-S21-04, Taipei, Taiwan (2007).
44. Shih-Wei Yin, Pi-Ju Cheng , Chung-Hao Tien, "Transmission through composite nano aperture and effects of surface plasmon resonance," CLEO07, JThD56, Baltimore, USA (2007).
45. Yen-Hsing Lu, Yu-Kuo Cheng and Chung-Hao Tien, "A Localized Partition Approach for High-Dynamic- Range Display," SID07, P-69, Long Beach, USA (2007).
46. Ming-Chin Chien, Chung-Hao Tien, Cho-Chih Chen, Yen-Hsing Lu, "Region-Partitioned LED Backlight Design for Field Sequential Color LCD," SID07 P-67, Long Beach, USA (2007).
47. Ming-Chin Chien, Cho-Chih Chen, Yen-Hsing Lu, Hao-Chung Kuo, Chung-Hao Tien and Su-Chin Yang, "LED Light Lit for Field-Sequential-Color Backlight System," Asia Display, Shanghai, China (2007).
48. Yen-Hsing Lu and Chung-Hao Tien, "Design of Mosaic-Form LED Backlight Module," Asia Display, Shanghai, China (2007).
49. Tzu-Hsiang Lan and Chung-Hao Tien, "Servo Study of Radially Polarized Beam in High-NA Optical Data Storage System," ISOM06, Th-I-57, Takamatsu, Japan (2006).
50. Yen Hsing Lu and Chung-Hao Tien, "A Novel Direct-LED-Backlight Unit Using Grooved Hexagonal Light-Guide Plate," SID06, 44.2, San Francisco, USA (2006).

