

Wang, Yu-Jen

National Chiao-Tung University, Taiwan
Liquid Crystal Laboratory, Institute of Electro-Optical Engineering
Rm. 417, Tin Ka Ping Bldg., No.1001, Daxue Rd., Hsinchu 30010, Taiwan (R.O.C.)
+886-3-571-2121 ext. 56393;
wangyujen.eo02g@g2.nctu.edu.tw

Education

National Chiao Tung University
Ph.D program, Photonics

Hsinchu, Taiwan
Feb. 2014 – present

National Chiao Tung University
B.S. Photonics (GPA:3.79/4.3)

Hsinchu, Taiwan
Sept. 2009 – June 2013

Research Interest

Liquid crystal optics for modulating phase and amplitude of light. The main focus are liquid crystal lenses and liquid crystal freeform optical elements; specific research areas includes

1. Structure design for polarizer-free property and lensing effect.
2. Imaging performance design and improvement via aberration correction.
3. Applications based on liquid crystal lenses:
 - augmented reality (AR), vision correction device (eyeglass), 3D integral image, endoscopy

Experience

Research intern, Facebook Reality Lab

– Sept. 2019 - Dec. 2019

1. Collaborated with the larger team to explore the application of liquid crystal tech in AR/VR near eye displays (cross-function position in Liquid Crystal Photonics team).
2. Prototyping for proof-of-concept; root-cause analysis with simulations and experiments; propose improved design; explore the limitation of liquid crystal optics for further production.

Visiting Scholar, UConn

– Aug. 2014 - Oct. 2014

1. Collaboration on projects regarding liquid crystal lenses, 3D imaging, and 3D display (NSF/IIS 1422179; advisor at UConn: Prof. Bahram Javidi).
2. Demonstrated 3D image with extended DOF (two journal articles with sum of IF>6).

Research Assistant for multiple projects:

1. "Augmented reality system with vision correction function using tunable liquid crystal lens [*translated title*]" Coretronic Inc. – 2018-2019
2. "Liquid crystal device in augmented reality" under Google faculty research award – 2018-2019
3. "Development and technology transfer of flexible contact lens with electrically tunable lens power for presbyopia correction," CooperVision, Inc. – 2015-2018
4. "A study of interactions between isotropic fluids and anisotropic liquid crystal molecules in nano-domains and related applications," National Science Council, ROC, – 2015-2018
5. "Electrically tunable ophthalmic lenses with large aperture size," Liqxtal Technology Inc.– 2013-2015.
6. "The physics of electrically tunable surface tension of liquid crystal and polymer composite film and development of applications," National Science Council, ROC – 2012-2014.

Software & Skill

1. Matlab, LCDMaster; exposed to Code V, Comsol, TechWiz, Mathematica, Polaris-M.
2. Project Management Professional (PMP, No. 2281968; acquired in 2018).

Activity, Honor, Scholarship

Reviewer in OSA publishing – 2015-present.
Merit Award in competition of 2016 Corning Future Innovator – 2016
SPIE Education Scholarship – 2016
Facilitator of SPIE Student Chapter Leadership Workshop – Sept. 2016
President of SPIE Student Chapter at NCTU – Term 2015
Treasure of SPIE Student Chapter at NCTU – Term 2014
National Chiao Tung University Students' Outstanding Contribution Award – 2013

Authorship (12 journals articles, 5 granted patents)

Journal Paper

1. **Yu-Jen Wang**, Huai-An Hsieh, and Yi-Hsin Lin, "Electrically tunable gradient-index lenses via nematic liquid crystals with a method of spatially extended phase distribution," *Optics Express* 27(22), 32398-32408 (2019).
2. **Yu-Jen Wang** and Yi-Hsin Lin, "An optical system for augmented reality with electrically tunable optical zoom function and image registration exploiting liquid crystal lenses," *Optics Express* 27(15), 21163-21172 (2019).
3. Yi-Hsin Lin, **Yu-Jen Wang**, and Victor Reshetnyak, "Liquid crystal lenses with tunable focal length," *Liquid Crystals Reviews* 5(2), 111–143 (2017)
4. **Yu-Jen Wang**, Po-Ju Chen, Xiao Liang, and Yi-Hsin Lin, "Augmented reality with image registration, vision correction and sunlight readability via liquid crystal devices," *Scientific Reports* 7:433 (2017). doi:10.1038/s41598-017-00492-2
5. **Yu-Jen Wang**, Yu-Shih Tsou, Ming-Syuan Chen, and Yi-Hsin Lin, "An optical image stabilization using a droplet manipulation on a liquid crystal and polymer composite film," *Liquid Crystals* 43, 2002-2008 (2016). (**Invited paper**)
6. Hung-Shan Chen, **Yu-Jen Wang**, Po-Ju Chen, and Yi-Hsin Lin, "Electrically adjustable location of a projected image in augmented reality via a liquid-crystal lens," *Optics Express* 23, 28154-28162 (2015).
7. **Yu-Jen Wang**, Xin Shen, Yi-Hsin Lin, and Bahram Javidi, "Extended depth-of-field 3D endoscopy with synthetic aperture integral imaging using an electrically tunable focal-length liquid-crystal lens," *Optics Letters* **40**, 3564-3567 (2015).
8. Xin Shen, **Yu-Jen Wang**, Hung-Shan Chen, Xiao Xiao, Yi-Hsin Lin, and Bahram Javidi, "Extended depth-of-focus 3D micro integral imaging display using a bifocal liquid crystal lens," *Optics Letters* 40, 538-541 (2015).
9. Hung-Shan Chen, Yi-Hsin Lin, Chia-Ming Chang, **Yu-Jen Wang**, Abhishek Kumar Srivastava, Jia Tong Sun, and Vladimir Grigorievich Chigrinov, "A polarized bifocal switch based on liquid crystals operated electrically and optically," *Journal of Applied Physics* 117, 044502 (2015).
10. Hung-Shan Chen, **Yu-Jen Wang**, Chia-Ming Chang, and Yi-Hsin Lin, "A polarizer-free liquid crystal lens exploiting an embedded-multilayered structure," *IEEE Photonics Technology Letters* **27**, 899-902 (2015).
11. Hung-Shan Chen, Yi-Hsin Lin, Abhishek Kumar Srivastava, Vladimir Grigorievich Chigrinov, Chia-Ming Chang, and **Yu-Jen Wang**, "A large bistable negative lens by integrating a polarization switch with a passively anisotropic focusing element" *Optics Express* 22,

13138-13145 (2014).

12. Hung-Shan Chen, Michael Chen, Chia-Ming Chang, **Yu-Jen Wang**, and Yi-Hsin Lin, "Simulation Study on Polarization-Independent Microlens Arrays Utilizing Blue Phase Liquid Crystals with Spatially-Distributed Kerr Constants," *Micromachines* **5**, 859-867 (2014).

Patent

1. Invention: "電控變焦的消色差透鏡" (**Patent No: TWI676071**, 2019-11-1)
2. Invention: "液晶光電裝置及液晶光電裝置的製造方法" (**Patent No: TWI668505B**, 2019-08-11)
3. Invention: "具備視力矯正功能之頭戴式顯示裝置" (**Patent No: TWI641868B**, 2018-11-21).
4. Invention: "Head-mounted display apparatus" (**Patent No: US10222621**, 2019-03-05).
5. Invention: "頭戴式虛擬物件成像裝置" (**Patent No: TWI647485**, 2019-01-11).
6. Invention: "Flexible liquid crystal cells and lenses" (Pub No: WO2019030491, 2019-02-14).
7. Invention: "具备视力矫正功能的头戴式显示装置" (Pub No: CN107305293A, 2017-10-31).