

Curriculum Vitae

Notarization. I have read the following and certify that this *curriculum vitae* is a current and accurate statement of my professional record.

Chensheng Wu

1/05/2020

I. Personal Information

I.A. Last Name, First Name, Contact Information

Wu, Chensheng, cwu2011@umd.edu

I.B. Academic Appointments at UMD

- Assistant Research Scientist (07/01/2018-now)
- Lecturer (08/20/2018-12/21/2018)
- Postdoctoral Research Associate (08/22/2016-06/30/2018)

I.C. Educational Background

- 08/22/2011-08/21/2016, Ph.D. in Electrical and Computer Engineering, University of Maryland College Park, Maryland, U.S.
- 09/01/2007-08/01/2011, B.E. in Microelectronics, Tsinghua University, Beijing, China
- 09/01/2007-08/01/2011, B.S. in Economics, Tsinghua University, Beijing, China

II. Research, Scholarly, Creative and/or Professional Activities

II.A. Refereed Journals (corresponding author *)

1. **Chensheng Wu***, Daniel A. Paulson, John Rzasa, and Christopher C. Davis, "A light field camera study of near ground turbulence anisotropy and observation of small outer-scales," Opt. Lett. (2020, accepted)
2. Adhvayith Sriram, **Chensheng Wu***, Robert Lee, and Christopher C. Davis, "Exploiting forward-scattering asymmetry in imaging and surface profile measurements through scattering media," OSA Continuum. (2020, accepted)
3. **Chensheng Wu***, Jonathan Ko, and Christopher C. Davis, "Lossy wavefront sensing and correction of distorted laser beams," Appl. Opt. (2020, accepted)
4. Daniel A. Paulson, **Chensheng Wu**, and Christopher C. Davis, "Randomized spectral sampling for efficient simulation of laser propagation through optical turbulence," J. Opt. Soc. Am. B 36, 3249-3262 (2019)
5. **Chensheng Wu***, Daniel A. Paulson, John R. Rzasa, and Christopher C. Davis, "Comparison between the plenoptic sensor and the light field camera in restoring images through turbulence," OSA Continuum 2, 2511-2525 (2019)
6. **Chensheng Wu***, Daniel A. Paulson, John R. Rzasa, and Christopher C. Davis, "Extracting phase distortion from laser glints on a remote target using phase space plenoptic mapping," J. Opt. Soc. Am. B 36, 1964-1971 (2019)
7. Miranda van Iersel, Daniel A. Paulson, **Chensheng Wu**, Nathaniel A. Ferlic, John R. Rzasa, Christopher C. Davis, Michael Walker, Mary Bowden, Jonathan Spychalsky, and Franklin Titus, "Measuring the turbulence profile in the lower atmospheric boundary layer," Appl. Opt. 58, 6934-6941 (2019)
8. **Chensheng Wu***, Jonathan Ko, John R. Rzasa, Daniel A. Paulson, and Christopher C. Davis, "Phase and amplitude beam shaping with two deformable mirrors

- implementing input plane and Fourier plane phase modifications," *Appl. Opt.* 57(9), 2337-2345 (2018)
9. **Chensheng Wu***, Jonathan Ko, Joseph Coffaro, Daniel A. Paulson, John R. Rzasa, Larry C. Andrews, Ronald L. Phillips, Robert Crabbs, and Christopher C. Davis, "Using turbulence scintillation to assist object ranging from a single camera viewpoint," *Appl. Opt.* 57, 2177-2187 (2018)
 10. **Chensheng Wu***, John R. Rzasa, Jonathan Ko, Daniel A. Paulson, Joseph Coffaro, Jonathan Sychalsky, Robert F. Crabbs, and Christopher C. Davis, "Multi-aperture laser transmissometer system for long-path aerosol extinction rate measurement," *Appl. Opt.* 57, 551-559 (2018)
 11. **Chensheng Wu***, Jonathan Ko, and Christopher C. Davis, "Plenoptic mapping for imaging and retrieval of the complex field amplitude of a laser beam," *Opt. Express* 24, 29852-29871 (2016)
 12. **Chensheng Wu***, Jonathan Ko, and Christopher C. Davis, "Using a plenoptic sensor to reconstruct vortex phase structures," *Opt. Lett.* 41, 3169-3172 (2016)
 13. **Chensheng Wu***, Jonathan Ko, and Christopher C. Davis, "Imaging through strong turbulence with a light field approach," *Opt. Express* 24, 11975-11986 (2016)
 14. W. Nelson, J. P. Palastro, **C.Wu**, and C. C. Davis, "Using an incoherent target return to adaptively focus through atmospheric turbulence," *Opt. Lett.* 41, 1301-1304 (2016)
 15. **Chensheng Wu***, Jonathan Ko, and Christopher C. Davis. "Determining the phase and amplitude distortion of a wavefront using a plenoptic sensor." *JOSA A* 32.5, 964-978 (2015)
 16. Nelson, W., J. P. Palastro, **C.Wu**, and C. C. Davis. "Enhanced backscatter of optical beams reflected in turbulent air." *JOSA A* 32, no. 7, 1371-1378 (2015)

II.B.

Conference Proceedings

1. "Characterization and compensation of atmospheric effects on laser beams" *SPIE* (2019)
2. "Fundamental differences between the plenoptic sensor and the light field camera in imaging through turbulence." *SPIE* (2019)
3. "Observing single and multiple laser glints through anisotropic turbulence with a plenoptic sensor." *SPIE* (2019)
4. "Near ground surface turbulence measurements and validation: a comparison between different systems." *SPIE* (2018)
5. "A multi-aperture laser transmissometer for detailed characterization of laser propagation over long paths through the turbulent atmosphere." *SPIE* (2018)
6. "A detailed comparison of non-Kolmogorov and anisotropic optical turbulence theories using wave optics simulations." *SPIE* (2018)
7. "Object detection and geometric profiling through dirty water media using asymmetry properties of backscattered signals." *SPIE* 2018.
8. "Hybrid wavefront sensing and image correction algorithm for imaging through turbulent media." *SPIE* (2017)
9. "Phase and amplitude modification of a laser beam by two deformable mirrors using conventional 4f image encryption techniques." *SPIE* (2017)
10. "Atmospheric characterization on the Kennedy Space Center Shuttle Landing Facility." *SPIE* (2017)
11. "Imaging through water turbulence with a plenoptic sensor." *SPIE* (2016)
12. "Complex wavefront sensing with a plenoptic sensor." *SPIE* (2016)
13. "Implementation of a rapid correction algorithm for adaptive optics using a plenoptic sensor." *SPIE* (2016)

14. "Entropy studies on beam distortion by atmospheric turbulence." *SPIE* (2015)
15. "Imaging through turbulence using a plenoptic sensor." *SPIE* (2015)
16. "Object recognition through turbulence with a modified plenoptic camera." *SPIE* (2015)
17. "An adaptive optics approach for laser beam correction in turbulence utilizing a modified plenoptic camera." *SPIE* (2015)
18. "Determining beam properties at an inaccessible plane using the reciprocity of atmospheric turbulence." *SPIE* (2015)
19. "Phase and amplitude wave front sensing and reconstruction with a modified plenoptic camera." *SPIE* (2014)
20. "Experimental results on the enhanced backscatter phenomenon and its dynamics." *SPIE* (2014)
21. "3D geometric modeling and simulation of laser propagation through turbulence with plenoptic functions." *SPIE* (2014)
22. "Intelligent correction of laser beam propagation through turbulent media using adaptive optics." *SPIE* (2014)
23. "Enhanced backscatter of optical beams reflected in atmospheric turbulence." *SPIE* (2014)
24. "Modified plenoptic camera for phase and amplitude wavefront sensing." *SPIE* (2013)
25. "Geometrical optics analysis of atmospheric turbulence." *SPIE* (2013)
26. "Using a plenoptic camera to measure distortions in wavefronts affected by atmospheric turbulence." *SPIE* (2012)

II.C.

Research Projects

II.C.1.

Government Funded

- Next Generation Lunar Retroreflectors (NASA-National Aeronautics and Space Administration 2019-2021)
- Novel optical sensing schemes for underwater imaging (NAVAIR-Naval Warfair Center Aircraft Division 2017-2020)
- Laser Beam Propagation Through the Low Atmosphere in Deep Turbulence (ONR-Office of Naval Research 2012-2016)
- Atmospheric Propagation Sciences of High Energy Lasers (ONR-Office of Naval Research 2016-2020)
- Cooperating Camera Platforms for Improved Video Quality and Feature Extraction Capability (U.S. Department of Transportation Federal Highway Administration 2012-2015)

II.C.2.

Contract Based Research

- Studies of Plenoptic Sensors and Enhanced Backscatter for Improved DE Laser Beam Correction and Targeting (LOCKHEED MARTIN 2017-2019)
- Nanoscale Rotating Magnetic Transmitter A Mechanically Based Antenna (AMEBA) Project (Vesperix Corporation 2018-2019)
- Adaptive optics for nonlinear atmospheric propagation of laser pulses (Toyon Research Cooperation 2017-2018)

II.D.

Patent Disclosures Filed by University of Maryland

- "Multi-Aperture Transmissometer." (2019)
- "Full Optical OAM (Optical Angular Momentum) Demultiplexing Receiver for High Speed Free Space Laser Communication." (2019)

- "Light Field Based Novel Adaptive Optics Technique for Directed Energy Systems." (2017)
- "Fast Turbulence Removal Technique with Modified Plenoptic Camera." (2017)
- "Improved Method for Laser Directed Energy Focusing on Targets." (2017)

II.E. Research Fellowships, Prizes and Awards

- ECE Distinguished Dissertation Award, University of Maryland College Park, 2016
- Ph.D. Research Assistant 2011~2016
- Distinguished Ph.D. Fellowship in Electrical Engineering Department, MD, 2011

III. Teaching, Extension, Mentoring, and Advising

III.A. Courses Taught

- *Fall 2018, ENEE408E: Capstone Design Project: Optical System Design, Instructor*
- *Fall 2016, ENEE205: Electric Circuits, Substitute Instructor*
- *Spring 2012, ENEE313H: Introduction to Device Physics (Honored Course), Teaching Assistant*
- *Fall 2011, ENEE303H: Analog and Digital Electronics (Honored Course), Teaching Assistant*

III.B. Advising: High-school and Undergraduate Students

- 2019 Summer, high school research internship, Adhvayith Sriram
- 2013 Fall, independent study, Serge Iswamo (African American Student), now works as an Electromagnetic Effects Engineer in Boeing, Orlando, FL
- 2013 Summer, ENEE499 Senior Projects in Electrical and Computer Engineering, Alina Tyshkun (woman student), now works in Vencore Inc, CA

IV. Service and Outreach

IV.A. Editorships, Editorial Boards, and Reviewing Activities

IV.A.1. Reviewing Activities for Journals and Presses

- I serve as a frequent reviewer (reviewed >100 manuscripts) for Elsevier Journals (such as: Optics and Lasers in Engineering, Optics communications), IEEE Journals (such as: Transactions on Instrumentation & Measurement, Journal of Lightwave Technology, and Photonics Journal), and OSA Journals (such as Optics Express, Optics Letters, and Applied Optics, JOSA A&B)
- I was recognized as distinguished reviewer for IEEE Transactions on Instrumentation & Measurement, 2018

IV.B. Committees, Professional & Service

I have been a conference session chair for *SPIE Optics and Photonics* (held annually in San Diego), on areas of Laser beam propagation through the atmosphere and oceans, 2015~2019.