Yu (Jerry) Shi

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EDUCATION

Stanford University, Stanford, CA	Sept. 2013 – Sept. 2018 (Expected)		
Ph.D. in Electrical Engineering			
Research advisor: Professor Shanhui Fan			
Research concentration: Nanophotonics			
Stanford University, Stanford, CA	Sept. 2013 – June 2015		
M.S. in Electrical Engineering			
Overall GPA: 3.928			
The Ohio State University, Columbus, OH	Sept. 2009 – May 2013		
B.S. in Electrical and Computer Engineering with a minor i	n physics		
Graduated with Summa Cum Laude, Honors in Engineering	Graduated with Summa Cum Laude, Honors in Engineering, and Honors Research Distinction		
Overall GPA: 3.991			

RESEARCH EXPERIENCE

 Graduate Research Assistant, Stanford University Edward L. Ginzton Laboratory. Advisor: Professor Shanhui Fan Nonreciprocal electromagnetics and optical isolation Computational electrodynamics: FDFD, FDTD, RCWA Photonic design with adjoint variable optimization Photon-phonon interactions Metamaterials and metasurfaces Radiative thermal management 	Sept. 2013 – Present
 Undergraduate Research Assistant, The Ohio State University Advisor: Professor Betty Lise Anderson Phased array antennas Optical true-time delay element design 	Dec. 2011 – June 2013
TEACHING EXPERIENCE	
Invited Guest Lecturer Numerical Electromagnetics Workshop (Stanford Optical Society)	May 10, 2018
Advanced Topics in Nano-Optics and Plasmonics (Prof. Jonathan Fan)	May 1, 2017
Graduate Teaching Assistant, Stanford University	
EE 236B – Guided Waves. PI: Prof. Shanhui Fan	Jan. 2016 – Mar. 2016
Undergraduate Teaching Assistant, The Ohio State University	
Fundamentals of Engineering for Honors Program	Aug. 2012 – May 2013

JOURNAL PUBLICATIONS

- Cheng Guo, Meng Xiao, Momchil Minkov, Yu Shi, and Shanhui Fan "Photonic crystal slab Laplace operator for image differentiation," *Optica* 5, 251-256 (2018).
- Yu Shi, Qian Lin, Momchil Minkov, and Shanhui Fan.
 "Invited Article: Nonreciprocal Optical Dissipation Based on Direction-dependent Rabi Splitting," *IEEE JSTQE, published online* (2018).
- Jiahui Wang, Yu Shi, Tyler Hughes, Zhexin Zhao, and Shanhui Fan.
 "Adjoint-based optimization of active nanophotonic devices," *Optics Express* 26, 3236-3248 (2018).
- 4. **Yu Shi**, Wei Li, Aaswath Raman, and Shanhui Fan. "Optimization of multi-layer optical films with a memetic algorithm and mixed integer programming," *ACS Photonics* **5**, 684-691 (2018).
- Yu Shi, Seunghoon Han, and Shanhui Fan.
 "Optical circulation and isolation based on indirect photonic transitions of guided resonance modes," *ACS Photonics* 4, 1639-1645 (2017).
- Momchil Minkov, Yu Shi, and Shanhui Fan.
 "Exact solution to the steady-state dynamics of a periodically modulated resonator," *APL Photonics* 2, 076101 (2017).
- Kai Wang, Yu Shi, Alexander Solntsev, Shanhui Fan, Audrey Sukhorukov, and Dragomir Neshev. "Non-reciprocal geometric phase in nonlinear frequency conversion," *Optics Letters* 42, 1990-1993 (2017).
- Wei Li, Yu Shi, Kaifeng Chen, Linxiao Zhu, and Shanhui Fan.
 "A Comprehensive Photonic Approach for Solar Cell Cooling," *ACS Photonics* 4, 774-782 (2017).
- Yu Shi, Alexander Cerjan, and Shanhui Fan.
 "Invited Article: Acousto-optic finite-difference frequency-domain algorithm for first-principles simulations of on-chip acousto-optic devices," *APL Photonics* 2, 020801 (2017).
- Yu Shi, Wonseok Shin, and Shanhui Fan.
 "Multi-frequency finite-difference frequency-domain algorithm for active nanophotonic device simulations," *Optica* 3, 1256-1259 (2016).
- Luqi Yuan, Yu Shi, and Shanhui Fan.
 "Photonic gauge potential in a system with a synthetic frequency dimension," *Optics Letters* 41, 741-744 (2016).
- 12. Yu Shi and Shanhui Fan.

"Dynamic non-reciprocal meta-surfaces with arbitrary phase reconfigurability based on photonic transition in meta-atoms," *Applied Physics Letters* **108**, 021110 (2016).

13. Saara Khan, Chia-Ming Chang, Zain Zaidi, Wonseok Shin, **Yu Shi**, Audrey Ellerbee Bowden, and Olav Solgaard.

"Metal-insulator-metal waveguides for particle trapping and separation," *Lab on a Chip* **16**, 2302-2308 (2016).

- 14. Yu Shi, Zongfu Yu, and Shanhui Fan.
 "Limitations of nonlinear optical isolators due to dynamic reciprocity," *Nature Photonics* 9, 388-392 (2015).
- 15. Saara Khan, **Yu Shi**, Chia-Ming Chang, Catherine Jan, Shanhui Fan, Audrey K Ellerbee, and Olav Solgaard.

"Optical separation of heterogeneous size distributions of microparticles on silicon nitride strip waveguides," *Optics Express* **23**, 8855-8866 (2015).

16. Yu Shi and Betty Lise Anderson."Robert cell-based optical delay elements for White cell true-time delay devices," *Journal of Lightwave Technology* 31, 1006-1014 (2013).

CONFERENCE PRESENTATIONS

- 1. Yu Shi, Wei Li, Aaswath Raman, and Shanhui Fan, "Memetic algorithm optimization for thin-film photonic structures for thermal and energy applications," *CLEO: SF2I.8* (2018).
- 2. Yu Shi, Momchil Minkov, Qian Lin, and Shanhui Fan, "Nonreciprocal optical manipulation using dynamic modulation," *URSI NRSM* (2018).
- 3. **Yu Shi**, Alexander Cerjan, and Shanhui Fan, "Acousto-optic finite-difference frequency-domain algorithm for first-principles simulations of on-chip acousto-optic devices," *OSA NLO: NM2A.2* (2017).
- 4. Yu Shi, Wonseok Shin, and Shanhui Fan, "Multi-frequency finite-difference frequency-domain algorithm for active nanophotonic device simulations," *CLEO: FTu3H.2* (2017).

HONORS AND AWARDS

•	Stanford Graduate Fellowship	2014
•	Stanford Enlight Fellowship	2013
•	Most Outstanding FEH Undergraduate Teaching Award	2013
•	OSU ECE Duhamel Scholarship	2010 - 2012
•	OSU Shurtz Award	2010
•	OSU International Undergraduate Scholarship	2009

STUDENT MENTORSHIP

Jiahui Wang

2017 - present

 Graduate student in Applied Physics, Stanford University. Mentored her project on adjoint variable optimization of modulated nanophotonic devices and nonreciprocal optical elements, as well as the journal paper write-up of her paper.

Cheng Guo

2017 - present

- Graduate student in Applied Physics, Stanford University. Mentored his project on designing an image differentiator with a photonic crystal slab with eigenmode analysis of photonic structures.

Nathan Zhao

2017 - present

 Graduate student in Applied Physics, Stanford University. Mentored his projects that involve the Schur complement of the FDFD algorithm, as well as the coupled-mode and RCWA analysis of the reflection properties of graphene ribbons.

PROFESSIONAL ACTIVITY

Journal Review and Service

- Reviewer for ACS Photonics, Applied Physics Letters, Optics Express, JOSA B, Photonics Technology Letters, Advance Optical Materials, AIP Advances

Membership

- Optical Society of America, 2017 to present

LEADERSHIP EXPERIENCE

Workshop Coordinator Stanford Research Experiences for Undergraduates Program	2017 - 2018
Committee Member Stanford Electrical Engineering Admit Week Panelist	2017
Membership Chair Stanford Optical Society of America	2014 - 2015