

LETIAN WANG

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SUMMARY

A result-driven researcher with solid analytical background and hands-on experimental skills in nanophotonics and optical diagnostics. Actively seeking internship/ full-time positions in optical hardware and instrumentation analytics.

1. **Instrumentation** for optical diagnostics using spectroscopy and photo-detection with ns or fs resolution.
2. **Nanofabrication tape out** of 200nm node photonics using production lithography layout design to fabrication
3. **Numerical analysis and programming** on scientific simulation using MATLAB and C++
4. **Optical simulation** with FDTD and Zemax with sufficient electromagnetism theories.
5. **Nanophotonics** expertise including Mie scattering and optical metasurfaces.
6. **Mathematical modeling**: fluent in statistics and complex network (US modeling contest top 0.5%)
7. **Project management** of multiple tasks within academic and industrial setting
8. **Cross-functional collaboration** across thermal, mechanical, electrical optical and biological disciplines
9. **Results delivery**: 8 publications and 5 working papers, as well as 4 academic and 2 industrial presentation

EDUCATION

University of California, Berkeley

Berkeley, CA

- Ph. D. Candidate, Department of Mechanical Engineering

Aug. 2014 – Present

Courses: Optical Engineering, Solid State Physics, Software Development for Scientific Computation, Heat Transfer

Tsinghua University

Beijing, China

- Major: B. Eng. in Mechanical Engineering, GPA: 3.91, Ranking 3/85

Sep. 2010 – Jul. 2014

- Minor: B. Sci. in Economics, GPA upon request

Sep. 2011 – Jul. 2014

RESEARCH EXPERIENCE

Graduate Student Researcher, Laser Thermal Lab, UC Berkeley

Costas P. Grigoropoulos

Optical Metasurfaces for Accelerating Deep Learning Inference

Oct. 2018 – Present

- Proposal Writing: based on Diffractive Deep Neural Network(D2NN), proposing the design and experimental realization for a multilayered optical metasurfaces for speed-of-light inference of large-scale deep neural networks.

Thesis: Laser-induced Phase Transformation of Silicon Nanostructure

Aug. 2014 – Present

- Simulation: algorithm check and optimization of a Monte-Carlo based MATLAB and C++ hybrid house-built simulator
- Optical diagnostics: setup fiber and free space hybrid micro-spectroscopy and transient optical detection system.
- Nanofabrication: start from industry standard mask layout design to photolithography, etching and deposition to final nanophotonics arrays and transient electrical probing device (3 layers).
- Outcome1: developed a high throughput experimental and characterization protocol towards single crystal generation.
- Outcome2: probed for the first time a single nanoresonator's phase change dynamics and compared it with simulation
- Outcome3: demonstrated the world's first reversible phase-change silicon nanoresonator with 200nm addressable resolution and 50-400 cycle times; showcased applications of structural color display and tunable Fresnel Zone Plate(FZP)

Nanophotonics: Laser Scalable Patterning and Writing of Photonic Metasurfaces

Feb. 2017 – Present

- Lead: femtosecond laser fabrication of Pancharatnam-Berry metasurfaces for optical beam steering [under preparation]
- Lead: optical modulated assembly and phase-switching of silicon nanoparticle arrays [ACS Nano, 2018]
- Collaborative: laser direct writing of field-programmable metasurfaces on VO₂ film [Advanced Materials, 2017]

Sensor: Nanosecond-resolved Micron-scale Resistive Thermometer

Aug. 2017 – May. 2017

- Lead: developed and verified the fastest (10ns rise time) and smallest (50um) thermometer for laser processing[submitted]
- Instrumentation: iteratively conducted design, fabrication and validation of the thin-film sensor, carried out error analysis of whole measurement system and optimization on RF circuit, digital signal processing(DSP) and LabVIEW interface
- Industry Collaborative: supervised by Lam Research CTO office through bi-weekly reports and quarterly renewed funding

Undergraduate Research Training Program, Department of Thermal Eng., Tsinghua University

Zhen Yang

Computational Fluid Dynamics and Heat Transfer Analysis of Thermal Storage

Aug. 2012 - Oct. 2013

- Lead: studied non-uniform flow boundary condition's effect on a thermal tank's efficiency

[Applied Energy, 2015]

PROJECT EXPERIENCE

Numerical Analysis and Data-oriented Projects:

Online Courses: Machine Learning and Deep Learning

Sep. 2018 – Present

- Machine Learning/Neural networks and Deep Learning: Andrew Ng, Coursera
- Familiarity with TensorFlow toolkit and Keras API.

Scientific Computation Software: Phase-field based Dendritic Crystal Growth

Aug. – Dec. 2015

CS294-73, Prof. Phillip Colella, UC Berkeley

- Mastered Makefiles, version control, C++ and data structure basics, and algorithm complexity analysis[[link](#)]
- For final project, responsible for algorithm selection, code development and testing in a team of three [[Github](#)] [[Report](#)]

Complex Network: The Startup Affiliation Network in United States

Mar. – Jun. 2014

Economics minor degree paper, supervised remotely by Prof. Jianxi Luo, SUTD, Singapore

- Linked startups through VC investments and compared the network characteristics of Silicon Valley and Boston
- Outstanding economics minor degree paper awarded by School of Economics and Management, Tsinghua University

Complex Network: Measure Academic Impact

Feb. 2014

Interdisciplinary Contest in Modeling(ICM), 3-day Online Contest held by U.S. COMAP [[link](#)]

- Team lead (1st author), responsible for framework construction, algorithm selection and report writing in a team of three
- With no prior knowledge on complex networks, awarded as Finalist (top 0.5%) [[Details](#)]

Product Development:

Startup Bootcamp: Polarescent – Next Generation Quantum Dot with Polarized Emission

Sep. – Dec. 2017

Management of Technology Innovation Program, NSF I-Corp, supervised by Naeem Zafar, UC Berkeley[[link](#)]

- Team lead(CEO), responsible for concept generation and verification of the final product, construction and refinement of value proposition, also carried out detailed market research and 30+ cold calls [[Details](#)]

Product Development: RFID+ Internet Information System “THUnion”

Sep. 2012 – Apr. 2013

Tsinghua Computer and Information Center, supervised by Dr. Xinyu Zhang

- Team lead, initiated and formed a team of 12 students from 8 departments, proposing an information system [[Details](#)]
- Prototype won 2nd prize in national contest and \$5,000 award from social entrepreneurship contest

Volunteer and Activities:

Assembly PC and Documentary Filming for Improving Education in Rural China

Mar. – Jul. 2012

Student Association of Educational Poverty Alleviation(SAEP), Tsinghua University

- Gathered used PC parts and built new ones for elementary school students in rural area [[Details](#)]
- As one of main characters, participated in the filming of a 2-million-click documentary on Sina (reposted on Youtube), and raised \$30,000 for school upgrade, book purchase and sponsoring students visiting Beijing

TECHNICAL SKILLS

- **Experimental:** Optics, spectroscopy, ultrafast diagnostics, SEM, FIB, Nanophotonics Tape Out
- **Simulation:** Lumerical FDTD, COMSOL Multiphysics, Zemax, SolidWorks, Ansys Fluent
- **Programming:** MATLAB, C++, Python, LabVIEW

AWARDS

- Nano Block Grant Award from Graduate Division, UC Berkeley 2017,2018
- Lam Research Fellowship in College of Engineering, UC Berkeley 2016
- Seban Fellowship in Department of Mechanical Engineering, UC Berkeley 2015
- Outstanding Degree Paper Award in Tsinghua University 2014

OTHERS

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