

# 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 full-time / internship positions in optical hardware and instrumentation analytics.

1. 4 years of experience in **instrumentation** for optical and electrical diagnostics with LabVIEW integration
2. Strong **numerical analysis** and **programming capabilities** on scientific simulation using MATLAB and C++
3. 6 years of experience in **multiphysics simulation** including COMSOL, FDTD and Zemax
4. Research experience on **nanophotonics** including Mie scattering and optical metasurfaces.
5. Interdisciplinary **modeling**: statistics in econometrics and complex network (US modeling contest top 0.5%)
6. Full skillsets for **nanofabrication tape out** including lithography layout design and cleanroom fabrication
7. Multi-tasked **project management** within academic and industrial setting
8. **Cross-functional collaboration** across thermal, mechanical, electrical optical and biological disciplines
9. **Result 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, Statistical Thermodynamics, Semiconductor, Scientific Computation

### 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 Accelerated 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
- Optics: setup fiber and free space hybrid micro-spectroscopy and transient optical detection system.
- Outcome1: developed a high throughput method to correlate the laser pulse duration, energy with induced crystallinity
- Outcome2: probed for the first time a single nanodot'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 like optically rewritable 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 VO<sub>2</sub> 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, algorithm and LabVIEW interface
- Industry Collaborative: supervised by Lam Research CTO office through bi-weekly reports and quarterly renewed funding; delivered 4 field tests and 2 talks in its Fremont campus, one of which is streamed to multiple remote offices

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: investigated non-uniform flow boundary condition's effect on a thermal tank's efficiency [Applied Energy, 2015]
- Numerical Analysis: corrected one missing entropy term in the Partial Differential Equations from literature and implemented through C based user-defined function with commercial simulator

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## PROJECT EXPERIENCE

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### 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 (1<sup>st</sup> 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 2<sup>nd</sup> 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

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## TECHNICAL SKILLS

- **Experimental:** Optics, spectroscopy, ultrafast diagnostics, SEM, FIB, Nanophotonics Tape Out(100nm)
- **Simulation:** Lumerical FDTD, COMSOL Multiphysics, Zemax, SolidWorks, Ansys Fluent
- **Programming:** MATLAB, C++, Python, LabVIEW

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## 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

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## OTHERS

Please visit my online [Publication](#), [Research](#) and [Expertise](#) pages for more details

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