



Jessica Piper, Ph.D., P.E.

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PROFESSIONAL PROFILE

Dr. Jessica Piper brings a broad base of technical and professional experience to her work as a consultant. Dr. Piper's industry experience has allowed her to fine-tune her ability to communicate across job function and level, briefly and clearly explaining complex data. She has extensive knowledge of and works with product safety standards, including the National Electrical Code, UL, IEEE, IEC, battery system standards, and laser eye safety. In addition, Dr. Piper has extensive data science skills including Python/Pandas, SQL, statistical analysis, A/B testing, pipelines, dashboards, big (multi-GB) data, and visualization. Finally, she has domain-specific technical knowledge in optics, nanophotonics, semiconductor devices, and analog circuit design. Dr. Piper's technical interests span the nanoscale (LED IP litigation) to the huge scale (electrical construction defect investigation in a 70,000 square foot produce warehouse).

POSITIONS

Brillouin Consulting **Senior Consultant**

San Francisco Bay Area, CA
Oct 2025 - Present

Electrical Engineering expert helping clients on matters including NEC code compliance, electrical construction defect evaluation, electrical fire origin and cause, workplace electrical safety, lithium-ion battery safety and accident reconstruction, electrical consumer product safety standards and compliance, and consumer product failure analysis.

Google

Remote

Optical Metrology Data Analyst

Nov 2022 - Mar 2024

Within Google's AR hardware program, I leveraged my domain-specific knowledge about optics and diffractive waveguides by applying my communication, standards, software development, and data analysis skills. Worked with key stakeholders in design, process, product, and metrology, to codify org-wide metrology and KPI definitions. I implemented a data access API which was deployed across the org, and created software tools for the rapid analysis of optical waveguide test data and production of reports. I worked directly with the metrology and software engineering teams to integrate new metrology tools into our data management system.

Exponent

Menlo Park, CA

Managing Engineer

Jan 2018 - Apr 2021

Technical consultant assisting clients with failure analysis, process improvement, risk assessment, and standards compliance. Sold work to clients, developed test plans, assembled teams to conduct work, and managed budgets. Developed time domain reflectometry (TDR) data analysis method for touch sensor failure analysis, which enabled \$1.5M of project revenue over two years. Submitted expert report on optical thin film design for LED intellectual property ITC litigation. Submitted reports to CPSC in support of clients' product surveillance and recall efforts (consumer lighting and micromobility industries). Performed over 100 legal inspections related to e-cigarette accidents, and prepared and submitted more than 20 expert reports to both state and federal courts.

Developed optical near field transducer for heat assisted magnetic recording (HAMR). Transformed thin film simulation capability from 50 cases per week to millions, using custom transfer matrix code and freely available material property databases. Built and qualified precision angle-of-incidence reflectometer, greatly enhancing in-house capabilities for as-deposited optical thin film characterization. Drove hard disk head process changes through design of multilayer thin film stack experiments which proved that certain process steps led to unacceptable optical losses.

ACADEMIC CREDENTIALS

Stanford University

Stanford, CA
2015

Ph.D., Electrical Engineering

Worked with Dr. Shanhui Fan, researched the theory and simulation of nanophotonic and thin film structures, with focus on the design of sub-wavelength gratings for absorption control in atomically thin lossy materials (e.g. graphene, MoS₂).

- Three first-author papers, including one featured as ACS Photonics Editor's Choice (666 citations to date), and three additional collaborative papers.
- Oral presentations at SPIE Optics & Photonics, and International Conference on Near-field Optics (NFO-13).
- Organized Stanford University Photonics Retreat 2014, featuring keynote address by Nobel Laureate Carl Wieman.

University of Massachusetts

Lowell, MA
2010

B.S.E., Electrical Engineering

LICENSES & CERTIFICATIONS

- Professional Engineer, CA (E22643)
- NFPA Certified Fire Inspector

PUBLICATIONS | PRESENTATIONS

- Piper, J. R., & Fan, S. (2016). Broadband Absorption Enhancement in Solar Cells with an Atomically Thin Active Layer. ACS Photonics, 3(4), 571-577. doi:10.1021/acsp Photonics.5b00510.
- Liu, Y., Chadha, A., Zhao, D., Piper, J. R., Jia, Y., et al. (2014). Approaching total absorption at near infrared in large area monolayer graphene by critical coupling. Applied Physics Letters, 105(18), 181105. doi:10.1063/1.4901181.
- Wang, K. X., Piper, J. R., & Fan, S. (2014). Optical impedance transformer for transparent conducting electrodes. Nano Letters 14(5), 2755-2758. doi:10.1021/nl500741f.
- Piper, J. R., Liu, V., & Fan, S. (2014). Total absorption by degenerate critical coupling. Applied Physics Letters 104(25), 251110. doi:10.1063/1.4885517.
- Piper, J. R., & Fan, S. (2014). Total Absorption in a Graphene Monolayer in the Optical Regime by Critical Coupling with a Photonic Crystal Guided Resonance. ACS Photonics 1(4), 347-353. doi:10.1021/ph400090p.
- Piper, J. R., & Sprott, J. C. (2010). Simple Autonomous Chaotic Circuits. IEEE Transactions on Circuits and Systems II: Express Briefs, 57(9), 730-734. doi:10.1109/TCSII.2010.2058493.