Tobias Zypman
(201) 674-1104 ∙ tz2589@columbia.edu

EDUCATION
Princeton University, B.S.E, Electrical and Computer Engineering, **Summa Cum Laude**, GPA: 3.894,
2018 – 2022

Princeton University, M.Eng., Electrical and Computer Engineering, GPA: 3.962
2022 – 2023

Columbia University, PhD, Electrical Engineering
2023 –

HONORS
- Summa Cum Laude
- Tau Beta Pi
- Sigma Xi
- 2021-22 Optical Engineering Award of Excellence, given by the Department of Electrical and Computer Engineering, Princeton University

RESEARCH EXPERIENCE
Master's Thesis, Professor Paul Prucnal Laboratory, Electrical and Computer Engineering
Princeton University, September 2022 –
- Neuromorphic computing
- Worked on optimizing the guiding of incoherent light through a waveguide to allow for the development of an optical neural network using organic LEDs
- Characterized and simulated efficiency of various preliminary models using Zemax

Senior Thesis, Professor Paul Prucnal Laboratory, Electrical and Computer Engineering
Princeton University, September 2021 – May 2022
- Developed a sanitization device — comprised of a high-volume fan, ultraviolet LEDs, and Lambertian-reflecting material — to provide increased protection to passengers in public transportation environments
- Designed and optimized the sanitization device using Zemax
- Constructed, tested, and experimentally validated a physical prototype of the device

Lab Assistant, Professor Hakan Türeci Laboratory, Electrical and Computer Engineering
Princeton University, June – August 2021
- Studied laser-based reservoir computing
- Used Python to run simulations of laser-based reservoir computers
- Performed phase and amplitude estimation for both fully connected reservoirs and temporally-multiplexed ring reservoirs

Lab Assistant, Professor Jason Fleischer Laboratory, Electrical and Computer Engineering
Princeton University, June – August 2020
- Performed studies of Schlieren imaging to gain depth perception
- Developed analytical and computational tools to characterize and design the Schlieren system

Lab Assistant, Professor Claire Gmachl Laboratory, Electrical and Computer Engineering
Princeton University, June – August 2019
- Studied broadband mid-infrared scattering of highly porous alumina catalytic support for energy and chemical processing applications
- Performed IR characterization of metal oxides
- Learned to use and calibrate a Fourier-transform infrared spectrometer (FTIR)
- Used MATLAB to analyze transmission features of different alumina at varying angles

Lab Assistant, Professor Steven Eppell Laboratory, Biomedical Engineering
Case Western Reserve University, January – April 2018
- Studied mechanical properties of nanomaterials with atomic force microscopy (AFM)
- Performed data analysis to extract elasticity and viscosity values of samples

TEACHING EXPERIENCE

Assistant Instructor for ECE 203 (Electronic Circuit Design Analysis and Implementation)
Princeton University, February 2023 – May 2023
- Conducted weekly labs to familiarize students with electronic circuit design
- Graded problem sets and exams
- Coordinated with Professor Valavi (hvalavi@princeton.edu)

Course Support for ECE 351 (Foundations of Modern Optics)
Princeton University, September 2022 – December 2023
- Graded problem sets
- Provided students with feedback and answer students' questions regarding problem sets and class material
- Coordinated with Professor Türeci (tureci@princeton.edu) and Professor Wysocki (gwysocki@princeton.edu)

Princeton University Library Makerspace Consultant
Princeton University, September 2022 – May 2023
- Lead workshops involving 3D printers, cutter plotters, and large format printers (ex. custom sports sticker making)
- Conduct trainings for 3D printers and cutter plotters
- Help clients use onsite equipment and software (Adobe Illustrator, MakerBot, Cricut)

RELEVANT COURSEWORK
- Mechanics, Energy, and Waves (EGR 151)
- Mechanics: Shape and Motion (EGR 152)
- Advanced General Chemistry: Materials Chemistry (CHM 207)
- Computer Science: An Interdisciplinary Approach (COS 126)
- Electricity and Photonics (EGR 153)
- Linear Systems (EGR 154)
- Multivariable Calculus (EGR 156)
- Contemporary Logic Design (ECE 206)
- Electronic and Photonic Devices (ECE 308)
- Information Signals (ECE 201)
- Electronic Circuit Design (ECE 203)
- Mathematics in Engineering I (Differential Equations) (MAE 305)
- Introduction to Data Science (SML 201)
- Foundations of Modern Optics (ECE 351)
- Machine Learning for Predictive Data Analytics (ECE 364)
- Robotic and Autonomous Systems (ECE 302)
- Principles of Quantum Engineering (ECE 342)
- Introduction to Engineering Dynamics
- (MAE 206)
- Photonics & Light Wave Communications (ECE 458)
- Introduction to Robotics (MAE 345)
- Biomedical Imaging
- (ECE 452)
- Optical and Photonic Systems for Environmental Sensing (ECE 455)
- Special Topics in Information Science (Advanced Wireless Systems) (ECE 538)
- Laser Spectroscopy: New Technologies and Applications (ECE 550)
- Crowd Control: Understanding and Manipulating Collective Behaviors and Swarm Dynamics (MAE 567)
- Quantum Optics (ECE 456)
- Photonic Systems (ECE 559)
- Lessons from Biology for Engineering (MAE 550)

LEADERSHIP, SERVICE, AND OTHER WORK EXPERIENCE
- Princeton Men's Club Soccer Captain/Coach — February 2020 – May 2022
- Princeton Campus Recreation Sports Club Executive Council Member — April 2021 – May 2022
- Engineering Library Circulation Desk Assistant — September 2021 – May 2022
- Community Action Leader — September 2019

REFERENCES

Professor Claire Gmachl	Professor Paul Prucnal	Professor Ravin Bhatt
Princeton University	Princeton University	Princeton University
cgmachl@princeton.edu	prucnal@princeton.edu	ravin@princeton.edu