Alexander Sludds

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WORK EXPERIENCE

PHOTONIC ARCHITECT, LIGHTMATTER COPORATION
March 2023 - Present | Boston, MA

- Electronic-photonic co-design: Created models of photonic IP in verilogA. Created methodology for modeling different types of active and passive photonic components in verlog-A. Closely worked with analog team to enable co-simulation of photonic components and analog devices.
- Device design: Designed custom photonic sub-systems including vernier filters, broadband wavelength interleavers. Improved optical power handling of silicon thermal phase shifter to record breaking numbers (Watt class).
- Hardware bring-up: Led hardware demonstrations with customers of packaged photonic links.
- Created documentation framework and specifications for photonics tapeouts.

INTERN, LIGHTMATTER COPORATION
May 2022 - September 2022 | Boston, MA

RESEARCH ASSISTANT
MIT RLE: Dirk Englund Quantum Photonics Group
July 2018 - March 2023 | Cambridge, MA

- Published in high impact journals and conferences including Science, Nature Photonics, Science Advanecs, Physical Review X, CLEO, Photonics West and OFC.
- Led multiple silicon photonic tapeouts through a CMOS pilot line foundry (AIM photonics) incorporating designs with hundreds of active components that are used simultaneously.

EDUCATION

MASSACHUSETTS INSTITUTE OF TECHNOLOGY (MIT)
Cambridge, MA

Ph.D in Electrical Engineering (February 2023)
M.Eng. in Electrical Engineering and Computer Science (May 2019)
B.S. in Electrical Engineering and Computer Science (May 2018)

BRUNSWICK COMMUNITY COLLEGE (BCC)
Supply, NC | June 2014
Associates Degree in Arts
Associates Degree in Science

RELEVANT COURSES
Graduate Applied E and M
Nonlinear Optics
Algorithms
Signal Processing
Machine Learning
Numerical Simulation

AWARDS
NSF Graduate Research Fellowship (received April 2019) Best

Paper Award at OECC/PSC 2022 (Optoelectronics and Communications Conference) BCC President's Award : Awarded for

Highest GPA in graduating class at Brunswick Community College

PUBLICATIONS, PATENTS
Publications

- Delocalized Photonic Deep Learning on the Internet's Edge. A. Sludds, et al. Science 2022
- Deep Learning with Coherent VCSEL Neural Networks. Z. Chen, A. Sludds, et al. Nature Photonics 2023
- Freely scalable and reconfigurable optical hardware for deep learning. L. Bernstein*, A. Sludds*, et al. Scientific Reports (2021)
- Large-Scale Optical Neural-Networks based on Photoelectric Multiplication. R. Hamerly, L. Bernstein, A. Sludds et al. Physical Review X (2020)

Please see my google scholar for more publications.

Patents
I am author on more than 10 patents.

SKILLS

PROGRAMMING
Python • C++ • Keras • Tensorflow • Numpy • LaTeX

LICENCES
Amateur Radio Extra Class Licence : KC1GAZ • General Radiotelephone Operator License • Marine Radio Operator Permit • GMDSS Radio Operator License • Restricted GMDSS Radio Operator License • GMDSS Radio Maintainer's License • Ship Radar Endorsement

TEACHING EXPERIENCE
MIT
Jan 2016 – December 2022 | Cambridge, MA

- Grad TA for Silicon Photonics, Fall 2022
- Grad TA for Control Theory, Spring 2019
- Grad TA for Graduate Electromagnetics (6.630), Fall 2018
- Grad TA for Electromagnetics and Applications (6.013), Spring 2018
- Instructor for Introduction to Signals and Systems, IAP 2018, 2017, 2016
- Lab Instructor for Machine Learning, Fall 2017
- Lab Instructor for Circuits and Electronics (6.002), Fall 2017
- Lab Instructor for Control Theory, Spring 2017. EdX version summer 2016
- Instructor for Introduction to Digital Electronics, Fall 2016, 2017