

Orly Liba

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Summary

A PhD candidate in Electrical Engineering at Stanford University with over 10 years of experience in R&D of digital image processing algorithms and optical systems. Proficient in Matlab. Experienced in OpenCV, python, C/C++. Skills include: image processing, computer vision, optimization, machine learning, and optics design.

Professional experience

Research assistant, de la Zerda lab, Stanford School of Medicine, Stanford University

Stanford, CA, 11/ 2012 – present (expected: end of 2017)

I am developing optical and computational tools for medical imaging. First lab member. Main research goal: create a molecular imaging platform with optical coherence tomography (OCT). The research includes: optical design and implementation, signal processing, image processing, computer vision and machine learning.

Head teaching assistant, computational imaging and display course, Stanford University

Stanford, CA, 1-3/2016 and 1-3/2017 (expected)

Created and taught a one-hour weekly problem session. Mentored several students on their final class projects. Worked with the professor (Dr. Gordon Wetzstein) on designing the homework and exam.

Algorithms engineer and team leader, Paieon medical

Rosh ha'ayin, Israel, 12/2011 – 11/2012

Paieon medical offered imaging workstations that are designed to assist in all phases of cardiac navigation procedures, helping interventional cardiologists and radiologists optimize diagnosis and treatment. My position included closely leading a small team of image processing engineers while conducting R&D in computer vision.

Algorithms engineer and project manager, Tessera (DigitalOptics Corporation)

Tel Aviv, Israel, 12/2008 – 11/2011

The Tel Aviv offices of Tessera specialized in computational photography algorithms, optical design and image quality evaluation for miniature commercial cameras. My position included research, design and implementation of computational imaging algorithms and tools for image quality evaluation. After a year of employment, in addition to being part of the algorithms team, I managed a project which involved working with international customers and collaborating companies.

Officer, Israeli defense force, the technological unit of the intelligence corps

Tel Aviv, Israel, 6/2003 – 12/2008

Rank at discharge: Captain.

2007 – 2008: Lead a team which was at the core of major multi-disciplinary projects in the field of electro-optics. In charge of building and testing complex systems with tight deadlines.

2006 – 2007: R&D in the field of electro-optics.

2004 – 2006: Embedded software development and system design (programming language: C).

2003 – 2004: Officers course.

RF design engineer, RAFAEL Advanced Defense Systems Ltd.

Israel, 6/2002 – 6/2003

Design of high frequency microchips (MMIC), simulations of distributed systems (with ADS and AWR) and modeling of MMIC components.

Education

Stanford University, Stanford, CA, 9/2013 - present (expected: end of 2017)

PhD candidate, Electrical Engineering

Current GPA: 4.2/4.0

Advisor: Adam de la Zerda, PhD

Research: Medical and molecular imaging with optical coherence tomography (OCT).

Stanford Ignite, Graduate School of Business, Stanford, CA, 6-7/2016

Stanford Ignite is a certificate program that provides the business fundamentals necessary to succeed at any entrepreneurial or intrapreneurial venture. The curriculum consists of classes in both core business skills and functional skills. During Ignite, I worked with a small team on developing a business model for one of my PhD research projects.

Tel Aviv University, Tel Aviv, Israel, 2005 - 2008

M.Sc., Electrical Engineering

GPA: 97/100, ***Summa cum laude***

Major: physical electronics.

Advisor: Yael Hanein, PhD

Research thesis: Dissipative particle dynamics model of carbon nanotubes. The thesis work has contributed to an open source particle dynamics simulations project, SYMPLER.

Technion - Israel institute of Technology, Haifa, Israel, 1999 - 2003

B.Sc., Electrical Engineering and B.A, Physics ("Psagot" excellence program)

GPA: 95.1/100, ***Summa cum laude***

Majors: Communication, wave theory and electro-optics.

Projects: 1. Numerical analysis of electromagnetic waves. 2. High speed fiber optic lasers.

Honors & Awards

- Bio-X Travel Award (2016)
- Women in Molecular Imaging Scholar Award (2016)
- SPIE Optics and Photonics Education Scholarship (2016)
- Student Travel Stipend for the World Molecular Imaging Congress (2016)
- Bio-X Bowes Fellowship, Stanford University (2014, three years of PhD funding support).
- Graduate Fellowship Award, School of Engineering, Stanford University (2013, one year of funding).
- Research Excellence Scholarship, School of Engineering, Tel Aviv University. Received twice (2007 & 2008).
- The Wolf Foundation Scholarship for Academic Excellence (2008).
- Technion President Excellency Award. Received seven times (2000-2003).

Additional activities

Stanford Optical society:

- Chair of the Speaker's Committee (2016 – present) and member of the Speaker's Committee (2015-2016).
- Member of the Outreach Committee (2016 – present).
- Teaching Assistant to Prof. Audrey Bowden in an optics class at the Stanford Summer Engineering Academy (summer 2016).

Diversity in STEM:

- Active in the Women in Electrical Engineering group (WEE) as financial officer, webmaster and board member (2013 – present).
- Mentor for Stanford EDGE (Enhancing Diversity in Graduate Education) Fellowship Program (2016 – present).

Journal Publications

* Equal contribution

1. "Speckle-Free Coherence Tomography of Turbid Media", **O Liba**, MD Lew, ED SoRelle, R Dutta, D Sen, DM Moshfeghi, S Chu, A de la Zerda, arXiv **preprint**, arXiv:1609.00054 (2016).
2. "A hyperspectral method to assay the microphysiological fates of nanomaterials in histological samples", ED SoRelle*, **O Liba***, JL Campbell, R Dalal, CL Zavaleta, A de la Zerda, eLife 5, e16352 (2016).
3. "High-resolution contrast-enhanced optical coherence tomography in mice retinae", D Sen, ED SoRelle, **O Liba**, R Dalal, A de la Zerda, J. Biomed. Opt. 21 (6) (2016).
4. "Contrast-enhanced optical coherence tomography with picomolar sensitivity for functional in vivo imaging", **O Liba***, ED SoRelle*, D Sen, A de la Zerda, Scientific reports, Vol. 6, 23337 (2016).
5. "Quantitative contrast-enhanced optical coherence tomography", Y Winetraub*, ED SoRelle*, **O Liba**, A de la Zerda, Applied Physics Letters, 108, 023702 (2016).
6. "Biofunctionalization of Large Gold Nanorods Realizes Ultrahigh-Sensitivity Optical Imaging Agents", ED SoRelle, **O Liba**, Z Hussain, M Gambhir, and A de la Zerda, Langmuir, 31 (45), pp 12339–12347 (2015).
7. "Investigation of the Dynamic Behavior of Bridged Nanotube Resonators by Dissipative Particle Dynamics Simulation", **O Liba**, D Kauzlaric, Y Hanein, A Greiner and JG Korvink, International Journal for Multiscale Computational Engineering, Vol. 6, 549-562 (2008).
8. "Dissipative Particle Dynamics of Carbon Nanotubes", **O Liba**, Z Abrams, D Kauzlaric, A Greiner, JG Korvink, Y Hanein, Molecular simulation, Vol. 34, 737 - 748 (2008).
9. "Fully terminated Ka band high isolation, high power MMIC SPDT switch in GaAs PIN technology", **O Levy**, A Madjar, D Kryger, S Matarasso, IMS2003 (IEEE) (2003).

Patents

1. "Anisotropic denoising method", N Cohen, J Danowitz, **O Liba**, US Patent 20120224784, (2012).
2. "Improved image sharpening via gradient environment detection", **O Liba**, WO Patent 2012049276, (2012).
3. "Chromatic Noise Reduction Method and Apparatus", T Schwartz, E Ben-Eliezer, **O Liba**, N Cohen, US Patent App. 20120182454 (2012).
4. "Image Sharpening Via Gradient Environment Detection", **O Liba**, US Patent App. 20120093431 (2012).
5. "Continuous Edge and Detail Mapping Using a Weighted Monotony Measurement", **O Liba**, N Cohen, J Danowitz, US Patent App. 20120093419 (2012).

Conference presentations

- "High sensitivity contrast enhanced optical coherence tomography for functional in vivo imaging", O Liba, ED SoRelle, D Sen, A de la Zerda, SPIE Photonics West (2017, expected).
- "MOZART: High-resolution Optical Molecular Imaging System for Medical and Biological Applications", O Liba, ED SoRelle, D Sen, A de la Zerda, Stanford Photonics Research Center 2016 Annual Symposium (2016).
- "Spectral Analysis for Molecular Imaging with Optical Coherence Tomography (OCT) in vivo", O Liba, ED SoRelle, A de la Zerda, World Molecular Imaging Congress (2016).
- "Characterizing Nanoparticle Microbiodistribution Using Adaptive Dark-Field Hyperspectral Microscopy", O Liba, ED SoRelle, R Dalal, A de la Zerda, World Molecular Imaging Congress (2016).

Notable poster presentations

- "MOZART: High-resolution optical molecular imaging system for medical and biological applications", O Liba, E SoRelle, D Sen, A de la Zerda, Stanford Photonics Retreat (SUPR) (2016). Received second best poster award.
- "MOZART: High-resolution optical molecular imaging system for medical and biological applications", O Liba, E SoRelle, D Sen, A de la Zerda, Molecular Imaging Program at Stanford (MIPS) retreat (2015). Received the

best poster award.

- “Tissue Biodistribution of Plasmonic Nanoparticles with SubCellular Resolution Using Hyperspectral Microscopy and Machine Learning”, O Liba, D Shaviv, ED SoRelle, R Dalal, A de la Zerda, World Molecular Imaging Congress (2015).
- “DPD simulations of CNT resonators”, Nano computation, Technion (2007).
- “Dissipative Particle Dynamics of Carbon Nanotubes”, IVS2006, Tel Aviv University (2006).