Daniel Salo

Curriculum Vitae

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dancsalo

Education

2016 **M.S. in Engineering**, *Duke University, Durham, NC*, GPA: 3.80.
Advisor: Dr. Nimmi Ramanujam (BME), Dr. Larry Carin (ECE)

2014 **B.Sc. in Biomedical Engineering**, *NC State University, Raleigh, NC*, GPA: 3.94.
Bioinstrumentation Concentration. Minor in Piano Performance

Work Experience

2017 - Pres. **Data Scientist**, *Automated Insights*, Durham, NC.
Automated Insights ships Wordsmith, a web application that generates personalized content from data. I am adapting and implementing ML/DL solutions for NLP/NLG applications in Wordsmith.

Research Experience

2016 - 2017 **Deep Learning for Object Detection**, *Duke University*, Dr. Larry Carin.
Creating a semi-supervised, multi-view region-based CNN objection detection algorithm for threat detection in x-ray scans of carry-on luggage in airports. Funded by TSA.

2014 - 2016 **Optical Diagnostic Device**, *Duke University*, Dr. Nimmi Ramanujam.
Designed and constructed multispectral LED system for breast margin assessment with spectroscopy with Zemax and Solidworks. Funded by NIH. Decreased scan time by 12%, weight by 35%, and power consumption by two orders of magnitude.

2013 - 2014 **Home Health Monitoring**, *NC State University*, Dr. Andrew DiMeo.
Invented and produced a wearable device to detect the onset of pulmonary edema in patients with congestive heart failure. Earned first place at joint NC State/UNC Senior Design Competition.

2013 **Tissue Optics Theory**, *Washington University in St. Louis*, Dr. Mikhail Berezin.
Programmed NIR instrumentation with VB and Matlab and designed depth penetration experiments as an Amgen Scholar. Published 2 peer-reviewed papers.

Scientific Production

Peer-Reviewed Publications

2016 Zhang, H., Salo, D., Kim, D. M., & Berezin, M. Y. (2014). Penetration depth of photons in biological tissues from hyperspectral imaging in shortwave infrared in transmission and reflection geometries. Journal of Biomedical Optics, 21(12), 126006.

2014 Salo, D., Kim, D. M., & Berezin, M. Y. (2014). Multispectral measurement of contrast in tissue-mimicking phantoms in near-infrared spectral range of 650 to 1600 nm spectral range of 650 to 1600 nm. Journal of Biomedical Optics, 19(8), 086008.

Conference Abstracts

2014 Salo, D., Kim, D. M., & Berezin, M. Y. (2014). Wavelength-dependent measurement of contrast in NIR and extended NIR spectral range (650-1600 nm) in phantoms. In Proceedings of SPIE 8940 (Optical Biopsy XII, p. 89400O).

Oral Presentations

2017 **Smiths Detection**, Wiesbaden, Hesse, Germany.
"Probablistic Neural Networks for Semi-Supervised Learning"

2015 **Intro. to Finite Element Analysis**, *Duke University*, Durham, NC.
"Modeling the Efficacy of Photothermal Nanoparticles in the Resection of Urothelial Carcinomas Using Finite Element Methods"

2014 **Senior Design Symposium**, *NC Biotechnology Center*, Durham, NC.
"The EdemaBand: An In-Home Monitoring Solution for Patients with Congestive Heart Failure"

2014 **SPIE Photonics West**, *Optical Biopsy XII*, San Francisco, CA.
"Wavelength-dependent measurement of contrast in NIR and extended NIR spectral range (650 - 1600nm) in phantoms"

2013 **Abrams Scholar Symposium**, *NC State University*, Raleigh, NC.
"An Investigation of Electrode Materials for Abiotic Glucose Fuel Cells"

2012 **Abrams Scholar Symposium**, *NC State University*, Raleigh, NC.
"Fabrication of Electroanalytical Chemical Sensors for Application to Neurochemical Disorders"

Poster Presentations

2016 **GRC Image Science Conference**, *Stonehill College*, Easton, MA.
"LED Illumination System for the Intraoperative Quantitative Diffuse Reflectance Imaging of Breast Tissue Morphology"

2014 **Probabilistic Machine Learning**, *Duke University*, Durham, NC.
"A Multilayer Perceptron for the Differentiation of Fluorescently-Labeled Cervical Cells"

2013 **Amgen Research Symposium**, *Washington University in St. Louis*, MO.
"Development of Imaging Instrumentation for the Extended Near Infrared"

2013 **BCMBP Open House**, *Washington University in St. Louis*, MO.
"Development of Optical Instrumentation in the Extended NIR"

2012 **REU Research Symposium**, *"The City College of New York*, NY.
"Phase-Modulated Spectroscopic Ellipsometer Design"

Technical Skills

Programming Languages: Python (TensorFlow), Node.js, R, LaTeX, HTML5, CSS

Machine Learning: neural networks, support vector machines, semi-supervised learning, stochastic optimization, clustering

Statistical Methods: Bayesian inference, regression models, hierarchical models, hypothesis testing and confidence intervals, dimensionality reduction , non-negative matrix factorization

Software: Matlab, Zemax, Solidworks, PCB Artist, ANSYS, Adobe Creative Cloud

Selected Coursework: Linear Systems, Digitial Signal Processing, Microcontroller Applications, Signals and Systems, Numerical Linear Algebra, Image and Video Processing, Statistical Optics, Vector Spaces and Applications, Bayesian Statistics, Multivariate Analysis

Accolades

Awards

2016	NSF GRFP Honorable Mention	*Duke University*
2014	James B. Duke Fellowship	*Duke University*
2014	John T. Chambers Scholar	*Duke University*
2014	1st Place Senior Design Competition	*NC State University, UNC-Chapel Hill*
2013	Amgen Scholar	*Washington University at St. Louis*
2013	Barry Goldwater Nomination	*NC State University*
2011	Caldwell Fellow	*NC State University*
2011, 2012	Abrams Scholar	*NC State University*

Honors

2012 Phi Kappa Phi

2012 NC State Biomedical Engineering Honors Program

2010 NC State University Honors Program

Teaching Assistant

2016 **Intersection of Technology and Women's Health**, *BME 210*, Duke University.

2014 **Analog and Digital Circuits**, *BME 290*, NC State University.

Outreach

2015 - 2016 **Basketball Coach**, *Student U*, Durham, NC.
Planning and leading a biweekly basketball clinic after school with 10 - 12 middle school students.

2015 - 2016 **STEM Tutor**, *Student U*, Durham, NC.
Meet weekly with two students to prepare for the AP Calculus exam and AP Biology exam.

2014 - 2015 **FIRST Lego Robotics Coach**, *Student U*, Durham, NC.
Teaching basic programming and robotic concepts to a year-long team of 12 middle school students twice a week.

2014 **Science Instructor**, *Student U*, Durham, NC.
Wrote and gave lessons on elementary physics to a class of 12 public school students in the 8th grade for 6 weeks.

2013 **Science Camp Counselor**, *NC State University*, Raleigh, NC.
Coached a group of 8 high school students from underserved counties in North Carolina for a week in a variety of scientific activities.

2011 - 2013 **Engineering Ambassador**, *NC State University*, Raleigh, NC.
Gave tours to prospective students and led outreach events at elementary schools with custom-developed curricula.

Leadership

2012 - Pres. **Professional Jazz Pianist**, *Self-Employed*, NC.
Created a Wordpress site (http://www.jazzpianistnc.com/), performing regularly at weddings and special events, site is top 10 on Google for "jazz pianist nc".

2015 - 2016 **Duke GradX Talks**, *Duke University*, Durham, NC.
Served as the Technician. Emceed the event and created the website.

2015 - 2016 **BME Student Association**, *Duke University*, Durham, NC.
Served as the Chief Technology Officer. Created a new Wordpress site, designed new logos and graphics with the Adobe Creative Suite, and created a new social media brand for the group.

2011 - 2014 **The Upstairs Sextet**, *NC State University*, Durham, NC.
Organized our six-man band through the Music Department as the pianist. Performed at numerous on-campus and off-campus events.

2011 - 2014 **CRU Fellowship**, *NC State University*, Durham, NC.
Emceed weekly meetings of 1000 members from stage.