Michael L. Zucker
M.Eng. in Acoustics, B.S. in Physics
Associate Scientist – Cooperative Institute for Research in Environmental Sciences (CIRES)
DSP/Algorithm Development Consultant – Lucid Dimensions LLC
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Education

The Pennsylvania State University: Graduate Program in Acoustics, ARL, University Park , PA
M. Eng. in Acoustics, December 2008
Subject: Acoustics
Specialty: Acoustic Propagation Measurement and Modeling, Signal Processing and Classification
Graduate GPA: 3.59/4.00
Coursework: Fundamentals of Acoustics I & II, Acoustics in a Fluid Media I & II, Mathematical Methods of Engineering, Ocean Acoustics, Marine Bioacoustics, Digital Signal Processing, Transducers, Acoustics Data Measurement and Analysis, Marine Geology, Techniques in Experimental Acoustics

The Pennsylvania State University: Physics Dept., Eberly College of Science, University Park, PA
B. S. in Physics, Minor in Mathematics, May 2006
Undergraduate GPA: 3.72/4.00, Dean's List all semesters
Coursework: Principles of Chemistry I & II, Experimental Chemistry, Composition, Calculus I & II, Stellar Astronomy, Rhetorical Composition, Introduction to Mechanics, Theoretical Mechanics I & II, Vector Calculus, Effective Speaking, Ordinary Differential Equations, Introduction to Electricity and Magnetism, Electricity and Magnetism, Modern Physics, Partial Differential Equations, Linear Algebra and Matrices, Basic Problems in Philosophy, Philosophy in Composition, Biology, Introduction to Fluids and Thermal Physics, Thermal Physics, Introduction to Wave and Quantum Physics, Quantum Physics, Technical Writing, Psychology, Audio Engineering, Advanced Calculus I & II, Experimental Physics, Techniques in Computational Physics, Optics, Electronics, Complex Analysis

Employment

Associate Scientist, March 2017 – present
Data acquisition systems design for LiDAR applications. Signal processing analysis software development for noise reduction in post processing data products. Hardware and electrical design and fabrication. Feedback control systems design for laser control as well as motion compensation. Extensive use of LabView and Matlab software for acquisition and analysis. Circuit design and PCB layout and manufacturing for multilayer electronics boards.

DSP/Algorithm Development Consultant, February 2014 – present
Detection and classification algorithm development and user interface design/programming using Matlab and LabView platforms. Specialized in noise rejection, signature matching and dynamic classification (machine learning) algorithms. Primary client: Lucid Dimensions LLC, Lafayette CO. Design signal filter modules, false alarm (noise rejection) algorithms, signal classification algorithms and user interface design using LabView.

Research Experience

Laboratory for Atmospheric and Space Physics (LASP), Boulder, CO
Professional Research Assistant, January 2013 – May 2013, April 2014 - Present
Supervisor: Dr. Sebastian Schmidt
Design and build circuit boards and radiometer instrumentation for aircraft, Matlab signal processing programing, LabView instrumentation control programing, power systems management and wiring.

The National Snow and Ice Data Center (NSIDC), Boulder, CO
Developer/Programmer, October 2011 – April 2014
Supervisor: Dr. Siri Jodha Khalsa
Development, maintenance and performance testing of satellite LiDAR web hosting services, Matlab programing.

The University of Colorado at Boulder: Center for Environmental Technology (CET), Boulder, CO
Graduate Research Assistant, January 2010 – August 2011
Supervisor: Dr. Albin J. Gasiewski
Development of advanced radiometer calibration and imaging software used in analyzing airborne measurements.

The Pennsylvania State University: Graduate Program in Acoustics, ARL, University Park , PA
Graduate Research Assistant, October 2006 – December 2008
Supervisors: Dr. David L. Bradley, and Dr. Kyle M. Becker
Participated in research and field campaign sponsored by the Office of Naval Research
Design and implementation of data acquisition system, propagation modeling, data measurement, management and analysis

The Pennsylvania State University: The Eberly College of Science, University Park, PA
Undergraduate Research Assistant, May 2005 – Aug. 2006
Supervisor: Dr. Steven Heppelmann
STAR project researcher using the RHIC particle accelerator at Brookhaven National Labs, New York.
Involved in the design and operation of the FMS (forward meson sensor) as part of the STAR project.

Software and Hardware Skills

Proficient in: Matlab, LabView, Advanced Digital Signal Processing (DSP), Microsoft Office, Windows systems and networks, HTML, PHP, SPICE, pCAD, acquisition system design, soldering, wiring, connector assembly, Cubase, Wavelab, Adobe Photoshop, Adobe Premiere, Adobe Dreamweaver
Experience in: C++, Pearl, MySQL, Mathematica, Linux systems and networks, Protools, Nuendo

Teaching Experience

The University of Colorado at Boulder: Department of Electrical, Computer and Energy Engineering, Boulder, CO
Teaching Assistant, Jan. 2011 – May 2011
Supervisor: Dr. Albin J. Gasiewski
Teaching assistant for Electromagnetic Fields and Waves lecture and lab course for the Department of Electrical, Computer and Energy Engineering.

The Pennsylvania State University: Graduate Program in Acoustics, University Park, PA
Teaching Assistant, Sept. 2007 – Dec. 2008
Supervisor: Dr. Christopher Barber
Teaching assistant for Principles of Digital Audio lecture course for the Acoustics Graduate College.

The Pennsylvania State University: The College of Electrical Engineering, University Park, PA
Teaching Assistant, Jan. 2007 – May 2008
Supervisor: Dr. Christopher Barber
Teaching assistant for Principles of Digital Audio lecture course for the Acoustics Graduate College.

The Pennsylvania State University: The University Learning Center, York PA / University Park, PA
Undergraduate Mathematics Tutor, 2004 – 2005
Supervisor: Dr. Myrna A. Covington
Tutoring Penn State students in college-level mathematics including all levels of Calculus, Differential Equations and Linear Algebra

Awards

AGU Outstanding Student Paper Award: 2011
Class of 1922 Memorial Scholarship: 2004/2005, 2005/2006
John and Elizabeth Holmes Teas Scholarship of Science: 2005/2006
Lane B Granville Memorial Scholarship: 2004/2005, 2005/2006
York General Scholarship in Science: 2003/2004

Professional Memberships

American Geophysical Union (AGU): Student Member
Acoustical Society of America (ASA): Student Member
Audio Engineering Society (AES): Student Member
Sigma Pi Sigma (SPS): National Physics Honors Society, Lifetime Member

Papers and Presentations

Michael L. Zucker, David L. Bradley, Kyle M. Becker.
"Impact of a Large Shipping Vessel on Acoustic Propagation in a Shallow Water Duct"
WSS Waterside Security Conference 2008 publication
Oral presentation at WSS conference in Copenhagen, Denmark
Presented methodology and results using advanced techniques in finite element modeling to solve underwater acoustics problems

Michael L. Zucker, David L. Bradley, Kyle M. Becker.
"Acoustic Propagation in a Shallow Water Duct with Large Obstructions"
ASA Acoustical Society of America 154th conference publication
Oral presentation at ASA conference in Miami, Florida
Presented computational methodology using advanced techniques in finite element modeling to solve underwater acoustics problems

Michael L. Zucker, Alexander Sutin, Alexander Sedunov, Vladimir Zhdanov
"Passive Acoustic Classification of Vessels in the Hudson River"
ASA Acoustical Society of America 158th conference publication

-Michael L. Zucker, Albin J. Gasiewski
‘‘Optimal Filtering of Gain and Offset Estimates for Passive Airborne Radiometer Measurements from the AMISA 2008 Arctic Science Campaign’’
2011 IEEE International Geoscience and Remote Sensing Symposium (IGARSS)