

BETHANY (MOATTS) NINE

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EDUCATION

Dallas Theological Seminary

(Location: Dallas, TX, U.S.A.)

Master of Arts Degree in Christian Education (in progress)

Current GPA: 3.83

Graduation: Spring 2016

University of Salford, Manchester

(Location: Salford, England, U.K.)

Master of Science Degree in Audio Acoustics

Graduated: Winter 2010

GPA (coursework) equivalency: approx. 3.68

University of Florida

(Location: Gainesville, FL, U.S.A.)

Bachelor of Science Degree in Electrical Engineering

Music Performance minor (cello)

Graduated: Spring 2009

GPA: 3.70

Magna Cum Laude honors designation (completed honors project and thesis)

Salzburg College

(Location: Salzburg, Austria)

Study abroad, on university scholarship, for music studies on cello for minor

Summer 2006

EMPLOYMENT

Teaching

The Cambridge School of Dallas

July 2015 - Present

Mathematics Professor

Classes taught: AP Calculus AB (12th), AP Physics 2, Algebra I (8th), Pre-Algebra (6th) [Saxon 8/7]

Full-time, salaried

Location: Dallas, TX

- Given full control over lesson and curriculum planning in all classes
- Offer students a Classical Christian education in mathematics and physics
- Tutor students regularly

Heritage Christian Academy

August 2014 - August 2015

Physics and Bible Teacher

Classes taught: Regular and Honors Physics (11th), New Testament (10th)

Three-quarters time (5 taught classes and 1 planning period per day), salaried

Location: Rockwall, TX

- Given full control over lesson and curriculum planning in all classes
- Created original PowerPoint slides to accompany each section covered in physics classes
- Planned all labs and homework assignments in physics classes
- Planned physics lessons with TEKS requirements in mind, submitted weekly lesson plans
- Tutoring session held once a week

Engineering

COMSOL, Inc.

April 2011 - August 2013

Applications Engineer

Full-time (40 hours/week), salaried

Location: Burlington, MA

- Responsible for helping engineers, researchers, professors, graduate students, and product designers in various industries understand how to use COMSOL Multiphysics software, a software package which uses primarily the Finite Elements Analysis (FEA) method to mathematically analyze and model various physics and multiphysics phenomena in academic and industrial research applications spanning almost every field of science
- Taught 3-hour COMSOL Workshops (averaging 3 per month) at universities, engineering companies, etc. around the eastern US and eastern Canada, using PowerPoint presentations and live software demonstrations to help customers and potential customers understand the mathematical basis of the software, which physics models it utilizes, and how to go about modeling their physics problem in COMSOL
- Taught postprocessing courses (4-8 hours long each) around the eastern US and eastern Canada (including instruction of the Postprocessing Minicourse at the COMSOL Conference 2012 with an audience of about 100) showing customers how they can create 2D- and 3D-visualizations, line graphs, vector maps, polar plots, etc. from their results and perform additional mathematical calculations derived from their analysis results
- Designed and recorded instructional videos showing customers how they can create 2D- and 3D-visualizations, line graphs, vector maps, polar plots, etc. from their results and perform additional mathematical calculations derived from their analysis results, posted on company's website (<http://www.comsol.com/video/browse/postprocessing/>)
- Answered questions from customers and pre-customers over the phone and through email regarding the use of COMSOL Multiphysics (especially questions related to electromagnetics, acoustics, and postprocessing/mathematical analysis)
- Wrote 8 blog entries for company's website highlighting postprocessing features of the software (<http://www.comsol.com/blogs/author/bethany-moatts/>)

Raytheon Company

Summer 2009

Electrical Engineering Operations Intern, Space and Airborne Systems (SAS) division

10-week internship (40 hours/week), salaried

Location: McKinney, TX

- Responsible for parts obsolescence on AAS-44 and AAS-49 Infrared Laser Tracking Sets used on military helicopters for customers in Turkey and Japan
- Interpretation of CAD drawings and other schematics for parts going obsolete to find new technology serving as a “form, fit, and function” replacement for the old
- Company representative responsible for contacting parts vendors (phone, email) to inquire about replacements
- Co-composed a parts obsolescence report that was sent to Fujitsu customers in Japan regarding parts obsolescence findings, Excel used extensively, led group meeting presenting final report to project management and team members
- Carried out tests in lab of some AAs-44 and AAS-49 components for troubleshooting effort
- Final internship presentation given to SAS leaders in SAS headquarters (California) via teleconference, received very favorably
- Offered full-time position, but declined in favor of attending grad school

Harris Corporation

Summer 2008

Electrical Engineering Intern

10-week internship (40 hours/week), salaried

- Worked on a Software-Defined Radio Internal Research and Development (SDR IRAD) program performing testing of an FPGA-based (field-programmable gate arrays) set-up in the lab, including trouble-shooting and development of coding to increase efficiency of testing procedure
- Used Cadence schematic capture to create circuit drawings for a related FPGA-based design

UF Electrical and Computer Engineering (ECE) Department

Fall 2007

Associate Counselor

Hours/week vary, salaried

- Worked directly under Department Chair and undergraduate counselor of UF's ECE Department
- Responsible for tutoring (Calculus I and Chemistry), mentoring, and offering career/academic advice to incoming freshmen electrical and computer engineering majors

GE Energy (General Electric)

Summer 2007

Software Test Engineering Intern for GE's XA/21 EMS (Extensible Architecture for the 21st Century Energy Management System)

10 weeks internship (40 hours/week), salaried

- Responsible for learning software architecture of eDNA historical database editor and its accompanying software test procedures in order to carry out testing with customer databases
- Attended official classes on basic software architecture of the entire XA/21 system including familiarization with a UNIX environment
- Presentation delivered to members of management regarding internship work

NASA SHARP (Student High School Apprenticeship Research Program)

Summer 2004

Electrical Engineering Intern

8 week program (40 hours/week), salaried

- Worked at Kennedy Space Center (KSC), FL in the OSB (Operations Support Building) with the Orbiter Electrical Division
- Conducted research under mentor's guidance investigating the degree of reliability the Hipot test offers at various potential levels for detecting wire chafing on the orbiter in respect to arch gap length between defective wiring and its neighboring semi-conducting material
- Final presentation on findings of research given at KSC Visitor's Center Complex to local science teachers, members of NASA management, and KSC Director James W. Kennedy

General Experience

Sales Associate, TJ Maxx

Summer 2005 and 2006

Cashier, Fitting Room Coordinator, backroom shipment handling, display coordinator

Customer Service Representative (CSR), Blockbuster Inc.

Summer 2005

Customer Service, Cashier, organizational duties

TEACHING CERTIFICATION

The Texas Institute for Teacher Education (Alternate Certification Program)

Science 7-12

Completed June 2015

THESES

Master's Thesis

Translating the optical concept of iridescence found in nature on butterfly wings, thin layers of oil, etc. into the acoustic domain to use as a diffuser with a frequency-dependent directionality. Determining ideal material properties (such as wavenumber and characteristic impedance) to achieve acoustic iridescence including investigation into using metamaterials to achieve such properties. Use of COMSOL Multiphysics to model Floquet-Bloch acoustic wave propagation within the first Brillouin zone of an array of rigid inclusions: utilized periodic boundary conditions, Helmholtz equation. Use of COMSOL Multiphysics with Matlab interface to carry out calculations involved in a semi-phenomenological model for determining the wavenumber and characteristic impedance of a given acoustic metamaterial: utilized the Incompressible Navier-Stokes Equation in Fluid Dynamics, Heat Transfer modeling, and Laplace's PDE.

Extensive use of Boundary Element Modeling (BEM), acoustic two-port modeling, MATLAB, and BEM-simulated impedance tube measurements.

Advised by Trevor Cox, president of the Institute of Acoustics and co-author of "Acoustic

Absorbers and Diffusers" with Peter D-Antonio, president of RPG Diffusor Systems, Inc.

Bachelor's Thesis (for Magna Cum Laude honors designation)

Design of "Amprotector": limiter for loudspeakers. Circuit design using op-amps, digital potentiometers, and microprocessor. C++ coding used to program microprocessor using an algorithm to achieve natural-sounding, non-disruptive attenuation control.

Evaluation based on thesis and presentation to a panel of 3 members of UF faculty.

SKILLS

Experienced in basic Microsoft-based applications (Word, Excel, PowerPoint, etc.)

Experience in C++ programming.

Modeling Software Experience: Odeon Room Acoustics Software, MATLAB, COMSOL Multiphysics (Multiphysics: Fluid Dynamics, PDE Modes, and Heat Transfer; Structural Mechanics: Mindlin Plate), various Boundary Element Modeling software, Quartus digital logic simulation, PSPICE circuit design, Ansoft Designer (antenna design), and Cadence integrated circuits schematic capture.

Acoustics Measurement Experience: Sound level measurement experience in a reverberation chamber, semi-anechoic chamber, and transmission suite (noise transmission through a wall). Other measurements include plate vibrations, impedance tube, and loudspeaker and microphone directivity. Psychoacoustic self-evaluations.

Selection of Classes:

Graduate level Math/Science: Numerical Techniques (acoustic computer modeling), Maths and Vibrations, (Theoretical) Acoustics and Signal Statistics, Digital Signal Processing, Room Acoustics, Psychoacoustics, Transducers and Sound Reinforcement, Transducer Design

Graduate level Education/Bible/Theology: Bible Study Methods and Hermeneutics, Educational Process of the Church, Introduction to Theology, Greek I and II, Old Testament History I and II, Trinitarianism, Soteriology, History and Philosophy of Christian Education, Teaching in Christian Higher Education, Women Teaching Women, Teaching Process (Summer '15)

Undergraduate level: Calculus I (AP), II (honors), and III (honors), Differential Equations (honors), Computational Linear Algebra, State Variables and Controls, Analytical Methods, Linear Controls, Signals and Systems, Physics I and II (honors), Chemistry I and II, Communication Systems, Digital Signal Processing, C++ Programming, Audio Engineering, Antenna Systems, Electromagnetic Fields I, Circuits I and II, Digital Logic, Electronic Circuits, Optics, Solid-State Devices, Electric Energy, Statics, Philosophy of Religion.

ACTIVITIES

Small Group Bible Study Leader

February 2012 – August 2013

Greater Manchester Vineyard Church - Cambridge, MA

Audio Engineer

August 2011 – August 2013

Greater Manchester Vineyard Church - Cambridge, MA

High School Youth Group Leader

August 2011 – August 2012

Greater Manchester Vineyard Church - Cambridge, MA

HONORS / MEMBERSHIPS

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|---|---------------------------|
| Presidential Scholarship (merit-based), Dallas Theological Seminary | Fall 2013 – Spring 2014 |
| Cellist, Cambridge Symphony Orchestra | August 2011 – August 2012 |
| Student Member of the Institute of Acoustics (IoA) | 2009 – 2010 |
| Scholarship, International Excellence (merit-based), University of Salford | Fall 2009 |
| Member of University of Florida Symphony Orchestra, cello | 2005 – 2009 |
| Perfect 800 quantitative score on GRE (Graduate Records Examination) | Fall 2008 |
| Sias Scholarship: Ethics in electrical engineering essay winner (presented by the Electrical and Computer Engineering Department) | Spring 2008 |
| Traina Engineering Scholarship (presented by College of Engineering) | Spring 2008 |
| Initiated into Phi Sigma Rho (Engineering Sorority) | Spring 2008 |
| Elected to Tau Beta Pi Engineering Honors Society | Spring 2007 |
| Elected to Eta Kappa Nu Electrical/Computer Engineering Honors Society | Spring 2007 |
| Elected to Golden Key National Honors Society | Fall 2006 |
| Wentworth Academic Scholarship (presented by UF Honors Program) | Spring 2006 |
| Scholarship for Study Abroad (presented by Department of Music) | Spring 2006 |
| Scholarship recipient, Bright Futures Academic (full tuition) | Spring 2005 |
| Scholarship recipient, Gator Club (UF Alumnae) of Brevard County | Spring 2005 |
| Scholarship recipient, Society of Women Engineers | Spring 2005 |
| Scholarship recipient, Society of American Military Engineers | Spring 2005 |
| Salutatorian of Merritt Island High School, GPA 4.53 | Spring 2005 |

CONFERENCES

Speaker/Instructor

COMSOL Conference: Waltham, MA (2012)
Taught Post-processing Course to a room of ~100 attendees

Attendee

Sponsored by the Institute of Acoustics:
Reproduced Sound: Brighton, England (2010)
The Art of Being a Consultant: Manchester, England (2010)