

Lauren E. Johnson

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Education

University of North Carolina at Charlotte

Master's in Electrical Engineering, GPA: 4.0, Expected Graduation: May 2019

Graduate Certificate in Cognitive Science, GPA: 4.0, Expected Graduation: May 2019

Bachelor's in Computer Engineering, GPA: 3.7, Graduated: Dec 2016

Central Piedmont Community College

Associates of Science, GPA: 3.6, Graduated: Dec 2013

Relevant Coursework

University of North Carolina at Charlotte

Applied Computer Graphics - Fall 2016

- The objective of this course was to provide students with a working knowledge of digital imaging sensors and techniques used to analyze digital images and design imaging systems.
- Concepts: visual image formation, digital imaging systems in 2D and 3D, image sampling and quantization, spatial and frequency domain processing of digital images, image compression, 3D digital images, mesh representation, algorithms for 3D image processing
- Projects: making your own Hubble image of Abell 1689, frequency domain image filter design, MATLAB simulation of 3D image formation, 3D stereo reconstruction

Artificial Intelligence - Spring 2017

- The objective of this course was to provide students with a working knowledge required to analyze and design computer vision and pattern recognition algorithms and systems.
- Concepts: probability theory, Bayesian estimation, multidimensional Gaussian distribution, basics of information theory, linear regression models, linear models for classification, Markov random field.
- Projects: polynomial fitting; optical character recognition using dimensionality reduction and a Principal Component Analysis (PCA) classifier; Markov chains and English text synthesis; kernel methods, Gaussian mixture models and the expectation maximization algorithm.

Applied Image Processing (Audit) - Spring 2018

- The lectures attended will cover the following concepts: Kalman filter with images, KLT tracking, optical flow.

Research Experience

Undergraduate Researcher - *University of North Carolina at Charlotte - Summer 2016*

- Wrote grant proposal for the Undergraduate Research Scholarship Program with NC Space Grant, and received funding.
- Assisted doctoral candidate with their research on range-only simultaneous localization and mapping (SLAM) method for indoor robotics.
- Designed and conducted experiments for data acquisition.
- Aided in troubleshooting MATLAB program.
- Presented findings at NC Space Grant Symposium 2016.
- Published conference paper titled "Utilization of XBee ZigBee modules and MATLAB for RSSI localization applications" at IEEE SoutheastCon 2017.

Undergraduate Research Assistant - *Charlotte Research Scholars – Summer 2015*

- Uncovered problem areas in occupational therapy where engineering solutions could be applicable.
- Designed solutions for automating certain occupational therapy tools.
- Participated in weekly meetings with project mentor and their graduate students.
- Attended weekly lectures on topics such as technical writing and ethics in research.

Teaching and Professional Experience

Teaching Assistantships - *University of North Carolina at Charlotte*

Electronics (ECGR 3132) - Spring 2018

- Graded quizzes and exams, provided instruction on technical reports and utilizing LaTeX, and assist lead teaching assistant with weekly recitation sessions.

Embedded Systems (ECGR 4101/5101) - Fall 2017

- Prepared and graded laboratory exercises, graded quizzes, provided information on troubleshooting circuits and debugging code, and graded exams.

Computer Engineering Programming II in C++ (ECGR 2104) - Spring 2017

- Aided professor during lectures, and taught students troubleshooting/debugging skills.

Systems & Electronics Lab (ECGR 3155) - Fall 2016

- Instructed weekly instrumentation laboratory exercises.
- Prepared weekly quizzes and final practical examination.

Logic Systems Design (ECGR 2181) - Fall 2015

- Prepared content and held weekly recitation sessions.
- Created YouTube videos for additional practice for students.
- Graded quizzes and exams.

Introduction to Electrical and Electronics Engineering (ECGR 1202) - Spring 2015

- Prepared and graded laboratory exercises, taught students how to troubleshoot circuits and debug code.
- Provided guidance and information on proper writing, and graded laboratory and essay writings.

Teaching Assistantships - Central Piedmont Community College

Introduction to Engineering (ENGR 101)- Fall 2012, Spring 2013

- Inventory and fill out order lists for parts needed for projects, stock and organize project toolboxes, and grade homework assignments and project toolboxes.
- Provided additional instructions for troubleshooting circuits, mechanical and civil projects for the course.

Summer Camp Instructor - Camps on Campus at UNC Charlotte

Robotics Summer Camp 101, 201, 301 - Summer 2016, 2017

- Implemented robotics summer camp curriculum which taught programming, troubleshooting, and robotics concepts to campers ranging from ages 9 – 18 years using the LEGO Mindstorms platform.
- Developed adapted material for each weekly group and year to allow for skilled/repeat students to continue learning and have fun every day of camp.

Robotics Summer Camp 102, 103 - Summer 2017

- Developed curriculum for students, ages 8-11, which taught programming, troubleshooting, and robotics concepts through a socially relevant issue: prosthetics.
- Taught students about arm prosthetics, anatomy, as well as soft skills such as team work for completing tasks together.
- Robotics 103 was created as a girls only camp to give them additional opportunities, and help inspire young girls to pursue STEM fields.

Engineering Intern - United Protective Technologies - April 2013 through January 2014

- Performed circuit analysis and design for old and new machines.
- Aided coworkers in LabVIEW debugging and programming.
- Helped with optimizing system designs, constructed optimized circuits, installed new parts, and rewired system circuits.
- Formed order lists, and provided documentation on tasks and research.
- Constructed framing for new parts and systems' structures.

Engineering Lab Assistant - Central Piedmont Community College - Fall 2012, Spring 2013

- Provided after hours assistance to all engineering and engineering technology students with lab equipment such as: oscilloscopes, power supplies, function generators, multimeters.
- Signed off on correctly implemented lab assignments for introductory level courses.
- Maintained and organized lab area and supplies.

Relevant Skills

- MATLAB, C++, Technical Writing, Research, Image Processing, Machine Learning

Publications

- **Lauren E. Johnson**, Nabila A. BouSaba, James M. Conrad. "The Validity of Technologies in Education: A Survey of Early Childhood Education Developmental Tools", *ASEE Annual Conference & Exposition*, 2017.
- Sam Shue, **Lauren E. Johnson**, James M. Conrad, "Utilization of XBee ZigBee modules and MATLAB for RSSI localization applications", *IEEE SoutheastCon*, 2017.

Grant Activity

- NC Space Grant Undergraduate Research Scholarship Program, NC Space Grant Consortium, \$5,000, May 1, 2016 - July 30, 2016.

Achievements and Awards

University at North Carolina at Charlotte

- NC Space Grant Undergraduate Scholarship - Fall 2015 through Spring 2016
- Women in Electronics Scholarship, ECE Department - Fall 2015
- Benjamin O. Hood Service Award, ECE Department - 2015

United Protective Technologies

- Outstanding Award and Scholarship, RAM Workshop VI - 2013

Professional Societies and Associations

University of North Carolina at Charlotte

- Tau Beta Pi NC Delta Chapter/UNCC Student Chapter Treasurer - 2017 to Present
- IEEE, Women in Electronics, Member/Charlotte Chapter Chair - 2017 to Present
- IEEE Eta Kappa Nu Honor Society - Fall 2016 to Present
- Tau Beta Pi Engineering Honor Society - Spring 2016 to Present
- Order of the Engineer, UNCC College of Engineering - Spring 2016 to Present
- IEEE, Student Member - Spring 2012 to Present
- IEEE Robotics and Automation Society, Student Member - Spring 2014 to Present
- Secretary of Charlotte Area Robotics - Spring 2014 through Spring 2015

Central Piedmont Community College

- Phi Theta Kappa Honor Society - 2013
- Mu Alpha Theta Honor Society - 2012 through 2013
- IEEE Student Chapter Secretary - Fall 2013
- IEEE Student Chapter Vice President - 2012

Community Service

University of North Carolina at Charlotte

Student Ambassador, UNCC ECE Department - 2014 through 2017

- Aided the ECE Department with open house tours with setup, cleanup, and talking to prospective students and their families about my experiences and providing any insights into choosing a discipline which will lead to the career a person wants.

Math Tutor, UNCC Engineering Early College - Spring 2016

- Provided tutoring for high school students in math and science, and guidance into choosing what to study in college.

NC State Championship FIRST Lego League Judge - Jan 2014

- Served as a team character judge and investigated how a team could work together to solve a problem and what they did when there were team dynamic complications.

Central Piedmont Community College

FIRST Robotics Mentor, Y.E.T.I. Team #3506 - 2011 through 2012

- Taught high school students proper procedures and usage of power tools.
- Aided with web design for the Y.E.T.I. web site.
- Reviewed and guided students' work for sponsorship grants.
- Reviewed SolidWorks designs made by Y.E.T.I. high school students.
- Provided guidance for students in building a robot for the 2012 competition season.