

# Dr. Jennifer Winikus

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## Education

### Michigan Technological University, Houghton, MI, USA

PhD in Computer Engineering Dec 2016

- Thesis research area: Multi-Modal Nonuniform Time Series Data Representation
- Research areas: Engineering Education, Curriculum Development, and STEM Outreach

MS Computer Engineering Aug 2014

### Alfred University, Alfred, NY, USA

MS Electrical Engineering May 2010

- Thesis: Active Control Systems for Magnetic Levitation Bearings for Wind Turbines
- Additional research: Genetic Algorithms for Medical Diagnostics

BS Electrical Engineering May 2008

- Minor: Materials Science Engineering
- Thesis: Piezoelectric Ceramic Behavior

## Teaching Experience

### Computer Science and Engineering Department, University at Buffalo, Buffalo, NY, USA

Teaching Assistant Professor Fall 2016 – Present

CSE 101- Computers: A General Introduction (4 terms)

CSE 113- Introduction to Computer Programming 1 (4 terms)

CSE 199- UB Seminar How the Internet Works (1 term)

CSE 241- Digital Systems (4 terms)

CSE 341- Computer Organization (1 term)

### Electrical and Computer Engineering Department, Michigan Technological University, Houghton, MI, USA

Graduate Teaching Instructor Spring 2015

EE 2174- Digital Logic and Lab (1 term)

### Electrical and Computer Engineering Department, Michigan Technological University, Houghton, MI, USA

Graduate Teaching Assistant Spring 2011 – Summer 2014, Fall 2015

EE 2174- Digital Logic and Lab (1 term)

EE 2303- Introduction to Electrical and Computer Engineering Lab (1 term)

EE 2304- Logic and Systems Lab (1 term)

EE 3010- Circuits and Instrumentation (3 terms)

EE 3010- Distance Learning Circuits and Instrumentation (6 terms)

EE 3171- Microcontroller Applications (2 terms)

EE 3306- Electrical Design with Microprocessors (6 terms)

# Educational Curriculum and Material Development Experience

**Electrical and Computer Engineering Department, Michigan Technological University,**  
Houghton, MI, USA

EE 2174- Digital Logic Laboratory Summer 2015 – August 2016

- Upgraded eight labs from previous versions to accommodate curriculum changes and upgrades to equipment through entire rewrites and restructuring.
- Wrote five entirely new labs.
- Created supplementary example materials to assist students with assignments.

EE 3010- Circuits and Instrumentation Lab Summer 2011 – Summer 2014

- Wrote new operational amplifier lab for on campus section.
- Maintenance conducted on most labs.
- Maintenance conducted on most distance learning labs 2011-2013 using NI ELVIS.
- Maintenance conducted on most distance learning labs 2013-2014 using NI MyDAQ.

EE 3171- Microcontroller Application Laboratory Summer 2014

- Designed to be taught with the utilization of the Texas Instruments Tiva Launchpad microcontroller using C, Microcontroller Laboratory.
- Developed new labs inspired by the previous labs and the Valvano text for the corresponding lecture, all labs written entirely.
- Developed lab structure to have technical communication conducted with technical memo in final project and use IEEE report style for report communication.

EE 3306- Electrical Design with Microprocessors Summer 2011 – Fall 2013

- Rewrote and restructured seven labs from a provided starting point.
- Developed final project assessment structure to include oral progress reports and IEEE style final report.

## Outreach Experience

**Computer Science and Engineering Department, University at Buffalo,**  
Buffalo, NY, USA

CSExplore 2017 – Present

- Supervise students in the development of the activities and curriculum.
- Developed of the infrastructure to support the camp.
- Running of the primary logistics for the camp.

**Electrical and Computer Engineering Department, Michigan Technological University,**  
Houghton, MI, USA

Women in Computing Visit Day Activity and Material Developer October 2015

- Developed a C-based programmable robot outreach activity for high school students for Michigan Technological University Visit Day programs.

Summer Youth Instructor and Material Developer 2012 – August 2016

- Developed the curriculum, planed schedule of activities, and supervised laboratory assistants.
- Taught all students in project sessions basic circuit theory, how to read a printed circuit board schematic and solder.

Electrical and Computer Engineering Youth Program

- Developed Activity book that includes introducing students to the core circuits, electronics and digital logic concepts.
- Developed an approach to guide students through the development of the skills to use Eagle CAD to design their own printed circuit boards which they will then put together later in the week.

Beginner Mobile Robotics Youth Program

- Developed activities using Lego Mindstorm EV3.

Mobile Robotics Youth Program

- Developed activities using Lego Mindstorm EV3.
- Developed approach to teach C programming of a MSP430 for a programmable robot.

Scholarship Programs

- Taught the Women in Engineering and Engineering Scholars, Electrical and Computer Engineering one hour exposure session.
- Developed and taught the five hour group projects for Electrical and Computer Engineering.

- Implemented group project activities based on open source project Drawdio and a hand held persistence of vision (POV) device.

## Publications

### Journals

- 1) **J. Winikus**, and L.E. Brown, “Representation of Clinical Information in Outpatient Oncology for Prognosis Using Regression”, *ASTESJ*, Vol 1, No 5, 2016.

### Conferences

- 1) **J. Winikus**, L. Ziarek, C. Alphonse, and J. Hartloff, “Improving Community, Retention, and Confidence in Computing Through Cross Course Collaborative Project Based Learning”, *IEEE Frontiers in Education*, 2018.
- 2) C. Rane, and **J. Winikus**, “A Virtual Oscilloscope Activity Designed for Promoting STEM to Young Women”, Joint Conference of the St. Lawrence Section of the American Society for Engineering Education and the New York Cyber Security and Engineering Technology Association, Buffalo, NY, April 2017.
- 3) **J. Winikus**, G.E. Archer, and L. Ott, Catalyzing Collaborative Conversation: “Working on how to solve the never ending problem of diversity in engineering”, *IEEE Frontiers in Education*, October 2016.
- 4) **J. Winikus**, and G.E. Archer, “Perspective of Teenagers on Traits and Research Associated with Electrical and Computer Engineers and their Research”, for *IEEE Frontiers in Education*, October 2016.
- 5) **J. Winikus**, and L.E. Brown, “Representation and Incorporation of Clinical Information in Outpatient Oncology Prognosis Using Bayesian Networks and Naïve Bayes”, presented at *IEEE EIT*, May 2016.
- 6) **J. Winikus**, “Impact of Sampling Methodology on the Performance of Naive Bayes and Bayesian Networks for Oncology Prognosis”, Rapid Fire Oral Presentation, SWE Region H Conference, Houghton, MI, USA, Feb 2014.

### In Preparation

- 1) **J. Winikus**, and L.E. Brown, “Dimensionality Reduction Addressing Nonuniform Multi-modal Time Series Data”.
- 1) C. Alphonse, **J. Winikus**, and L. Ziarek, “Cross Course Collaborative Project Based Learning”, to be submitted to SIGCSE 2019.

### Presentations

- 1) **J. Winikus**, “Representation And Incorporation Of Clinical Information In Outpatient Oncology Prognosis Using Bayesian Networks”, Oral Presentation, Graduate Student Research Colloquium, Michigan Technological University, Houghton, MI, USA, Feb 2016.
- 2) **J. Winikus**, “Perspective of Teenagers on Traits and Research Associated with Electrical and Computer Engineers and their Research”, Poster Presentation, Graduate Student Research Colloquium, Michigan Technological University, Houghton, MI, USA, Feb 2016.

## Panels

- 1) K. Gamble, S. Myslicki, J. Tsao, **J. Winikus**, and N. Woon, “Big step for me, giant leap for SWE-kind: staying involved in SWE after college”, WE18, Society of Women Engineers, Minneapolis, Minnesota, USA Oct 2018.
- 2) G. Hein, R. Reck, and **J. Winikus**, “Obtaining your first academic job/Academic Job Search”, WE 18, Society of Women Engineers, Minneapolis, Minnesota, USA Oct 2018.

## Invited Participation

### University at Buffalo

Tinker Camp

Aug 2017

- Guest Speaker on Computer Engineering

Accepted Student Visit Day

Apr 2017

- Mock Lecture – What is a Microcontroller?

### Michigan Technological University

Center for Precollege Outreach

WISE

Mar 2017, Feb 2016

- Introduced concepts and activity pertaining to electrical engineering.

Center for Teaching and Learning

New Graduate Teaching Assistant Orientation

2013-2015

- Provided advice to new graduate teaching assistants.
- Answered questions any students had each fall semester.

Electrical and Computer Engineering Department

New Graduate Student Orientation

2013-2016

- Welcomed new graduate student to the department community, provide information concerning the role of the peer mentoring program, introduce what graduate student government is and the representatives.
- Answered any questions students may have.

## Research

### Department of Computer Science and Engineering , University at Buffalo

Project: K-12 STEM Outreach

Sep 2016 – Present

- Collaborators: K. Schindler
- Students Supervised: Chinmayee Rane (Jan 2017 – Present) and Shanelle Iletto (Sep 2017 – May 2018).
- Development of new outreach activities.

Project: Cross-Course Collaborative Project Based Learning

Jun 2013 – Present

- Collaborators: C. Alphonse, J. Hartloff, and L. Ziarek.
- Students Supervised: Eithne Amo (Jan 2018 – May 2018), Greg Bunyea (Jan 2018 – Feb 2018), Brian Doyle (Sep 2017 – Present), Kai Bustos (Jan 2018 – May 2018), Vighnesh Iyer (Sep 2017 – May 2018), Aleksander Krinsky (Sep 2017 – Dec 2017), and Jean De Dieu Niyomugabo (Jan 2018 – May 2018).
- Development of new pedagogy for collaboration across courses.
- Development of assessment methods for collaborative activities across courses.
- Development of methods to determine the impact from the collaboration on perceptions and community.

### Electrical and Computer Engineering Department, Michigan Technological University

Project: Outpatient Oncology Prognosis

Jun 2013 – Present

- Advisor/Collaborator: Dr Laura E. Brown
- Examined representation approaches for nonuniform time series data to be used with regression techniques to determine the prognosis for length of survival.
- Explored discrete representation with spline and difference trend behavioral considerations evaluated with Bayesian Networks, Naive Bayes and Support Vector Machines for four category prognosis classification.

Project: STEM Outreach Perception

Mar 2014 – Aug 2016

- Advisor/Collaborator: Dr. Glen Archer

- Examined the perceptions students had of electrical and computer engineers and how they changed after interaction with electrical and computer engineers.
- Developed, applied and had IRB approved for exempt status to conduct a survey with the summer youth students.

Project: Microgrid Optimization May 2011 – Jun 2013

- Advisor: Dr. Wayne Weaver
- Conducted literature review.
- Explored the possibility of optimizing microgrid power generation using RPG adapted genetic algorithms and mosh pit enhanced particle swarm optimization.

SRAM Optimization Design Sep 2010 – May 2011

- Advisor: Dr. Zhuo Feng
- Conducted literature review.

**Electrical and Computer Engineering Department**, Inamori School of Engineering at Alfred University

Project: Active Control Systems Radial Magnetic Levitation Bearings for Wind Turbines Aug 2009 – May 2010

- Advisor: Dr. Jianxin Tang
- Constructed Passive Prototype to test feasibility of radial magnetic levitation bearings for wind turbines.
- Simulated multiple active control systems to act as stabilizer to the magnetic levitation bearing system.

Project: Genetic Algorithms for Medical Diagnostics Oct 2009 – Feb 2010

- Advisor: Dr. Jalal Baghdadchi
- Developed fitness function to adapt to accurate/inaccurate diagnosis in conjunction with symptoms present.

**Materials Science and Engineering Department**, New York State College of Ceramics at the Inamori School of Engineering at Alfred University

Project: Melilite Type Structure Improved Conductivity for Application to Electrolyte Layer of Solid Oxide Fuel Cells Aug 2008 – Jul 2009

- Advisor: Dr. Doreen Edwards
- Conducted Literature Review.
- Developed plan using Melilite and Gehlenite variations for experimental testing.

Project: Piezoelectric Ceramic Behavior Sep 2007 – May 2008

- Advisor: Dr. Walter Schulze
- Fabricated lead zirconate titanate piezoelectric ceramics through dry pressing, sintering, polishing, applying electrodes, polarization.
- Performed x-ray diffraction to examine characteristics of the PZT composition.
- Tested current and voltage behavior in short and open circuit over time to monitor polarization changes using LabView.

## Other Educational Experience

**Electrical and Computer Engineering Department, Michigan Technological University,**

Houghton, MI, USA

Grader- Electronic Circuits Fall 2010, Spring 2011

- A core circuit theory course.

Grader- Circuits and Instrumentation Fall 2014, Spring 2016

- A basic circuits introductory course and lab for non-electrical and computer engineering majors covering core concepts.

**Electrical and Computer Engineering Department, Michigan Technological University,**

Houghton, MI, USA

Lab Assistant

Logic and Systems Lab Fall 2010, Spring 2011

Microcontroller Application Laboratory Fall 2014

Digital Logic and Lab Spring 2016

- Assisted graduate teaching assistants with helping students during labs.

**Electrical and Computer Engineering Department, Michigan Technological University,**

Houghton, MI, USA

Learning Center Coach

Sep 2010 – May 2011

- Tutored undergraduate students in courses as needed across all courses offered during walk-in sessions.

## Grant Projects

### Awarded

*Title:* Creating and Assessing Cross-Course Collaborative Projects

*Agency:* University at Buffalo the State University of New York

*Role:* co-PI

*Effective Dates:* Summer 2017-Summer 2018

*Total Amount:* \$10,000

*Other PIs/co-PIs:* C. Alphonse, and L. Ziarek

## Awards

### Outstanding Teaching Award

2013 – 2014

Michigan Technological University, Graduate School

### Grace Hopper Celebration of Women in Computing NSF Scholarship

2013

### Jonathan Bara Outstanding Graduate Teaching Assistant Award

2013

Michigan Technological University,

Electrical and Computer Engineering Department

## Leadership

### Undergraduate Affairs Committee

University at Buffalo

- Diversity Subcommittee Co-Chair

Dec 2016 – Present

### Society of Women Engineers

Western New York Section

- Secretary

Jul 2018 – Present

### Society of Women Engineers

- WE Local Advisory Board Member

Jul 2018 – Present

### UB CSE50

University at Buffalo

- Publicity Committee Co-Chair

Jun 2017 – Present

### Eta Kappa Nu

Michigan Technological University

- Corresponding Secretary

Dec 2015 – Jul 2016

### GradSWE

Michigan Technological University

- Co-Director

Jan 2016 – May 2016

### Graduate Student Government

Michigan Technological University

- Treasurer
- Parliamentarian
- Electrical and Computer Engineering Department Representative
- Liaison to Undergraduate Student Government

May 2013 – May 2015

Oct 2012 – May 2015

Sep 2011 – May 2013

Oct 2012 – May 2013

### Institute for Electronics and Electrical Engineers

Alfred University

- President

May 2006 – May 2007

- Secretary

May 2007 – May 2008, Jan 2010 – May 2010

### **Hillel Campus Program**

Alfred University

- House Liaison, Treasurer and Secretary
- Club Co-Advisor

May 2007 – May 2008  
Sep 2008 – May 2010

## **Service Activities**

### **University at Buffalo**

Department of Computer Science and Engineering

- Undergraduate Affairs Committee
- Department Diversity Committee
- Lecturer Search Committee
- Accepted Student Postcard Initiative

Sep 2016 – Present  
Sep 2016 – Present  
Sep 2016 – Present  
Spring 2017, 2018

Tech Savvy

- CSE Session Organizer and Supervisor

Mar 2017, 2018

### **Society of Women Engineers**

- Women in Academia Committee Member
- Curriculum Committee Member
- Scholarship Reviewer
- Abstract Reviewer
- 2014 Region H Conference Volunteer

Jul 2017 – Present  
Jul 2017 – Present  
Feb 2018 – Present  
Jun 2018 – Present  
Spring 2014

### **American Society of Engineering Education**

Zone 1 2019 Conference Planning Committee

- Member

Apr 2018 – Present

### **NCWIT Academic Alliance**

- Department Representative

Mar 2017 – Present

### **Paper Reviewer**

- International Conference on University Learning and Teaching
- New York Celebration of Women in Computing
- International Conference on Art, Business, Education and Social Sciences
- Frontiers In Education

Sep 2016 – Present  
Jan 2017 – Present  
Feb 2017 – Present  
May 2017 – Present

### **Michigan Technological University**

Department of Electrical and Computer Engineering

- Graduate Student Feedback Group for the External Advisory Board
- Managed Peer Mentoring Program for Graduate Students
- Launched a Peer Mentoring Program for Graduate Students

Oct 2014 – Jul 2016  
Fall 2013 – Jul 2016  
Fall 2013

Academic and Community Conduct Board

- Graduate Student Member

Sep 2013 – Jul 2016

Undergraduate Design Expo

- Judge
- Graduate Student Orientation Facilitator

2014, 2015 Graduate School  
Fall 2011 – Spring 2016 (8 Times)

Ombuds Search Committee

- Member

Spring 2014

## **Other Work Experience**

### **New York State College of Ceramics, Alfred University, Alfred, NY, USA**

Technical Assistant

Sep 2008 – May 2010

- Assisted with the recording of lectures for the distance learning services.
- Assisted with the maintenance of the computer lab equipment and software.

### **Information Technology Services, Alfred University, Alfred, NY, USA**

Equipment Lending Manager

Sep 2009 – May 2010

- Monitored and maintained equipment used for lending to the university community.
- Scheduled student workers.

- Helpdesk Consultant Sep 2007 – May 2010
- Assisted users with computer support issues including windows and mac OSX operating systems, Microsoft Office, Blackboard Learning Management System, network connectivity and general issues.
- Tier 2 Service Consultant Sep 2008 – May 2009
- Provided virus and malware removal support.
  - Performed software and hardware installation.
- Lab Manager Sep 2007 – May 2008
- Scheduled student workers.
  - Performed the extensive maintenance as needed on the printers in the computer labs.
- Lab Consultant Sep 2005 – May 2008
- Maintained the supplies of the printers and equipment in the computer labs.

## Training

### University at Buffalo

- Safe Zone Program Spring 2018
- Trained about gender and sexual identities and issues facing and within the LGBTQ communities. It is for everyone to learn how to be better allies and increase awareness of resources on our campus and in Buffalo. The goal of this training is to inspire others to create safe and affirming environments for all members of our community.
- Diversity Zone Program Spring 2018
- Trained to be understanding of the diversity of identities, role of privilege, advocacy methods and allyship within systems of power and oppression.
- QPR Gatekeeper Training Dec 2016

### Michigan Technological University

- Safe Place Program 2013
- Trained to be a resource for individuals with questions or concerns related to Lesbian, Gay, Bisexual, Transgender, Queer, Questioning, Intersex, and Asexual (LGBTQIA\*) identities.
  - <http://www.mtu.edu/safeplace/>

### Collaborative Institutional Training Initiative (CITI)

- University of Miami
- Conflict of Interest Stage 1 Mar 2014, Dec 2016
  - Human Research Basic Course Mar 2014
  - Social and Behavioral Responsible Conduct of Research Course Dec 2016
  - Social & Behavioral Researchers Nov 2017

## Memberships

- Institute of Electrical and Electronics Engineers** 2005 – Present
- IEEE Women in Engineering 2005 – Present
  - IEEE Computer Society 2009 – Present
  - IEEE Computational Intelligence Society 2011 – Present
  - IEEE Education Society 2012 – Present
  - IEEE Engineering in Medicine and Biology Society 2013 – Present
  - IEEE Signal Processing Society 2014 – Present
  - IEEE Eta Kappa Nu 2015 – Present
- Society of Women Engineers** 2013 – Present