Jeffrey L. Falkinburg

Lecturer, Computer Engineering
School of Computing
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EDUCATION

MS Air Force Institute of Technology, Computer Engineering — Mar 2011
Top 10% of 72 Electrical and Computer Engineering Students in Dept
Thesis: "Dynamic Polymorphic Reconfiguration to Effectively "CLOAK" a Circuit's Function"
Advisor: Dr. Yong C. Kim

BS University of Nebraska – Lincoln, Computer Engineering — May 2007
Graduated Cum Laude
Minored in Computer Science

AS Community College of the Air Force, Electronic Systems Technology — May 2001

ACADEMIC APPOINTMENTS

Graduate Lecturer	University of Nebraska – Lincoln	Sep 2019 – Present
Lecturer	University of Nebraska – Lincoln	Aug 2018 – Present
Assistant Professor	University of Nebraska – Lincoln	Jun 2017 – Sep 2019
Assistant Professor	U.S. Air Force Academy	Jul 2016 – Jun 2017
Instructor	U.S. Air Force Academy	Jun 2014 – Jul 2016

AREAS OF SPECIALIZATION

VLSI Systems, Computer Architecture, Embedded Systems, Advanced Digital Design, Virtual Reality Design

HONORS AND AWARDS

Brig Gen Roland E. Thomas Award — 2016
Electrical and Computer Engineering Dept. Faculty award for outstanding contribution to cadet education

Dean of Faculty Team of the Quarter, Electrical and Computer Engineering Department---Design Excellence and IEEE Capstone Excellence Awards 2015
NeuroGroove "Adaptive Motorsports" Capstone Team recognized for team design awards

Air Force Material Command's (AFMC's) Joe Sciabica Innovators Award 2013
Gaming Research Integration for Learning Lab (GRILL) team recognized for innovators award

Nominee for Federal Engineer of the Year Award 2012
Air Force Research Laboratory Nominee for Federal Engineer of the Year Award

Science, Technology, Engineering and Mathematics (STEM) Award for Exploratory or Advanced Technology Development 2009
The AngelFire Team was recognized with this Air Force level STEM Award

HQ Air Force Research Laboratory (AFRL) "Commander's Cup Team" award 2008
The AngelFire Team was recognized with this AFRL level Award

AFRL/RW Scientific/Technical Achievement Team of the Year 2007 & 2008
The PAM Maritime Scene Generation was selected as team of the year

Senior Design Competition First Place Award for "Wireless Internet Radio" 2007
University of Nebraska – Lincoln (Omaha Campus) Computer and Electronics Engineering Department Annual Senior Design Competition

TEACHING EXPERIENCE

University of Nebraska – Lincoln, Lincoln, NE Aug 2018 – Present
Lecturer, School of Computing

- Full-time lecturer and graduate lecturer teaching computer science and engineering classes to prepare students to become exemplary engineers and scientists.
- College of Engineering (CoE) Curriculum Committee member responsible for the curriculum development within the CoE. Members oversee the development of new programs, changes within the program, determine how these changes affect other programs, and ensure the resources are available to implement the changes.
- Instructed CSCE 230 – Computer Organization, Fall 2018 (x1 section of 39 students), Fall 2019 (x1 Section of 44 students), Fall 2020 (x1 Section of 41 students), Fall 2021 (x1 Section of 26 students), Fall 2022 (x1 Section of 34 students).
    - This course is an introduction to organization and structure of computer systems and digital design.
- Instructed CSCE 231 – Computer Systems Engineering, Fall 2019 (x1 Section of 90 students).
    - This course is an introduction to organization, structure, and applications of computer systems.

- Instructed CSCE 336 (Formerly 236) – Embedded Systems, Spring 2019 (x1 section of 29 students), Spring 2020 (x1 section of 24 students), Fall 2020 (x1 Section of 7 students), Spring 2021 (x1 section of 14 students), Fall 2021 (x1 section of 4 students), Spring 2022 (x1 section of 29 students), Fall 2022 (x1 section of 8 students).
    - This course is an introduction to designing, interfacing, configuring, and programming embedded systems.
- Instructed CSCE 436/836 – Advanced Embedded Systems, Spring 2020 (x1 section of 9 students), Spring 2021 (x1 section of 19 students), Spring 2022 (x1 section of 9 students).
    - This graduate level course teaches the design, development, and implementation of advanced embedded HW & SW applications.
- Tribe Lead for six CSCE 486/487 – Senior Design teams, Fall 2019, Spring 2020, Fall 2020, Spring 2021, Fall 2021, Spring 2022, Fall 2022.
    - Senior Design's overall course objective is to help students in gathering very practical experience with interdisciplinary real-world roles, environments, and processes.

Air Force Reserve Officer Training Corp (AFROTC), Lincoln, NE Jun 2017 – Sep 2019
Assistant Professor, Department of Aerospace Studies, University of Nebraska – Lincoln

- Responsible for supervising, evaluating, and facilitating the performance of all Detachment 465 Cadets.
- Additionally, leads, trains, counsels and evaluates highly qualified men and women as prospective Air Force officers.
- Overall mission is to develop and commission the best Air Force leaders and citizens of character, dedicated to serving the Nation.
- Instructor for AERO 295 & 296 – The Evolution of US Air and Space Power I & II, Fall 2017(x2 sections of 7 & 8 students), Spring 2018 (x1 section of 12 students) , Fall 2018(x1 sections of 23 students), Spring 2019 (x1 section of 23 students).
    - This course covers the history of the development and deployment of airpower from the Wright Brothers' first flight to the Persian Gulf War and how the events were affected by technology, politics, doctrine, and geography. Emphasizes US airpower.
    - Laboratories covered introduction to cadet leadership training. Practical experience in leadership roles.

U.S. Air Force Academy, Air Force Academy, CO Jul 2016 – Jun 2017
Assistant Professor, Department of Electrical and Computer Engineering

- Full-time Instructor contributing to the ultimate mission of the U.S. Air Force Academy, to produce leaders of character
- Developed quizzes, exams, and homework
- Revised the syllabus to meet ABET accreditation standards

- Instructor for ECE 281 - Digital Design and Computer Architecture, Spring 2017 (x2 sections of 11 students each)
    - This course is an introduction to the fundamental principles of logic design to Engineers.
- Course Director (x4 sections) and Instructor (x2 sections of 5 & 11 students) for ECE 382 - Embedded Computer Systems I, Fall 2016
    - This course provides a broad understanding of microcontroller system and embedded programming practices.
- Course Director (x2 sections) and Instructor (x1 section of 7 students) for ECE 383 - Embedded Computer Systems II, Spring 2017
    - This is a course in the design of digital systems using microprocessors, special-purpose processors, and field-programmable gate arrays (FPGAs).

U.S. Air Force Academy, Air Force Academy, CO Jun 2014 – Jul 2016
Instructor, Department of Electrical and Computer Engineering

- Full-time Instructor contributing to the ultimate mission of the U.S. Air Force Academy, to produce leaders of character
- Developed quizzes, exams, and homework
- Revised the syllabus to meet ABET accreditation standards
- Instructor for ECE 315 - Principles of Air Force Electronic Systems, Fall 2014 (x3 sections of 22 students each), Spring 2015 (x1 section of 20 students), Fall 2015 (x1 section of 25 students)
    - This course is an introduction to electrical and computer engineering principles for non-Engineering Majors.
- Instructor for ECE 281 - Digital Design and Computer Architecture, Spring 2015 (x2 sections of 16 students each), Spring 2016 (x1 section of 8 students)
    - This course is and introduction to the fundamental principles of logic design to Engineers.
- Instructor for ECE 382 - Embedded Computer Systems I, Fall 2015 (x2 sections of 10 students each)
    - This course provides a broad understanding of microcontroller system and embedded programming practices.
- Course Director and Instructor for ECE 383 - Embedded Computer Systems II, Spring 2016 (x1 section of 13 students)
    - This is a course in the design of digital systems using microprocessors, special-purpose processors, and field-programmable gate arrays (FPGAs).

RESEARCH EXPERIENCE

University of Nebraska – Lincoln, Lincoln, NE Aug 2018 – Present
Lecturer, School of Computing

- Senior Design Sponsor AY 2021 – 2022, and extending them in AY 2022 – 2023

    - Husker Scope – This team built an app for IOS and Android that implements a Dual Channel Function Generator, AM/FM Modulator, and Single Channel Oscilloscope functionality for use within UNL engineering courses and around the world. Students are adding in a Spectrum Analyzer capability and developing a hardware interface to enable two-channel inputs outside the audio range and add a multi-channel inputs for a Logic Analyzer capability.
    - Husker STEM VR – This team is built a virtual reality outreach/recruitment app built for the Oculus Quest, iOS, Android, and Web App. Students built this virtual reality app for UNL's School of Computing and College of Engineering to encourage STEM outreach. This app began to help to make learning fun by creating a virtual reality app designed to create an engaging learning environment. Now that VR app has been extended to include multiple mobile platforms to increase the distribution even further.
- Faculty Advisor for three AY 2021 – 2022 Senior Design Honors Theses and two AY 2022 – 2023 Senior Design Honors Theses.

U.S. Air Force Academy, Air Force Academy, CO Aug 2015 – May 2017
Faculty Mentor ECE 463/464 - Capstone Design Project "NeuroGroove Adaptive Motor Sports": Department of Electrical and Computer Engineering

- Directed eight cadets the first year and eleven cadets the second year in the continued development to design and implement a system that takes an Android based headset that allows people with quadriplegia to drive a simulation, electric wheelchair, and eventually a racecar with only head movements.

711th Human Performance Wing, Wright-Patterson AFB, OH Mar 2011 – May 2014
Lead Engineer, Warfighter Training Systems: Warfighter Readiness Research Division

- Supervised, leads, and mentors five Air Force officer integrating intelligent agents/adversaries/threats into high-fidelity Live, Virtual, and Constructive (LVC) training research environments.
- Program manager for a $7.5M Commander's Research and Development Fund (CRDF) collaborative project for LVC Sensor Integration, & Data Fusion for Operations & Training (SIDFOT). The LVC SIDFOT effort is developing the architecture allowing integration of LVC sensor data through ad-hoc sensor networks enabling data fusion for innovative operations and training research. Leads 32 engineers and scientist spanning three AFRL Divisions to execute current/future funds with five contracting companies.
- Gaming Research Integration for Learning Laboratory (GRILL) test bed lead and lead engineer. The GRILL's mission is to increase cost-effectiveness of training by integrating game-based approaches into a family of complementary trainers for learning in Live, Virtual, and Constructive (LVC) environments. Integrated multiple game engines and evaluating the feasibility of using game-based technology in warfighter training systems. Partnered with system program office (SPO), contracting officers, and DoD joint partners to leverage low-cost OTS solutions.

- Lead engineer for Distributed Mission Operations (DMO) research by providing daily management and technical expertise for game-based capability integration.
- Directs five officers integrating intelligent agents/adversaries/threats into high-fidelity LVC training research environments.

Air Force Institute of Technology, Wright-Patterson AFB, OH Aug 2009 – Mar 2011
Graduate Student, Department of Electrical and Computer Engineering
Advisor: Dr. Yong C. Kim

- "Dynamic Polymorphic Reconfiguration to Effectively "CLOAK" a Circuit's Function"
  - Research to determine that a polymorphic circuit design capable of varying circuit power consumption and timing can protect a cryptographic device from Electromagnetic Analysis (EMA) Attacks
- Master's of Science in Computer Engineering program with a GPA of 3.765
- Emphasis in Very-Large-Scale Integrated Circuit Systems

Air Force Research Laboratory, Eglin AFB, FL May 2007 - Aug 2009
Scene Generation Computer Engineer, Munitions Directorate

- Program Manager in charge of $2M+ effort creating the "first ever" maritime simulation framework to support the Navy Non-Line of Sight Precision Attack Munition (NLOS-PAM) missile system.
- Competitively chosen for AngelFire deployment to Al Asad, Iraq in support of Operation Iraqi Freedom providing real-time wide area persistent ISR for the U.S. Marine Corps.

PUBLICATIONS

Falkinburg, J. (2011). *Dynamic Polymorphic Reconfiguration to Effectively "CLOAK" a Circuit's Function*. Wright-Patterson AFB: Air Force Institute of Technology.

Rice, D., Biagiotti, E., Elliott, E., Amstutz, P., & Falkinburg, J. (2013). Shareable Game-Based Objects Gateway for DIS and HLA Integration. *Spring Simulation Interoperability Workshop 2013 (2013 Spring SIW)*. San Diego: Curran Associates, Inc.

Whitted, G., Falkinburg, J. L., Wray, C., Speed, M., & Rodabaugh, T. (2013). Live, Virtual, and Constructive First Responder/Pararescue Training Research Test Bed. *Interservice/Industry Training, Simulation and Education Conference.*

PRESENTATIONS AND INVITED LECTURES

Falkinburg, J. (2022). Husker STEM VR project. *Nebraska VR Network for Education & Research (NeVRNER) Annual Meeting 6*. Omaha, NE.

Falkinburg, J. (2012). Live, Virtual, and Constructive (LVC) Sensor Integration and Data Fusion in Operations and Training (SIDFOT). *UAS Action Summit 2012: "From Battlefield to Farmfield"*. Grand Forks, ND.

Falkinburg, J. (2012). Live, Virtual, and Constructive (LVC) Sensor Integration and Data Fusion in Operations and Training (SIDFOT). *Spring Simulation Developer's Working Group (SDAWG)*. Las Vegas, NV.

Falkinburg, J., & Lamb, S. (2012). Gaming Research Integration for Learning Laboratory (GRILL). *Federal Laboratory Consortium (FLC) for Tech Transfer Midwest Regional Conference*. Dayton, OH.

Falkinburg, J., & Stanton, R. (2012). Live, Virtual, and Constructive (LVC) Sensor Integration and Data Fusion in Operations and Training (SIDFOT). *Defense Game Tech Users' Conference 2012*. Orlando, FL.

PROFESSIONAL TRAINING

U.S. Air Force Academy (USAFA) Educator Orientation Course
U.S. Air Force Academy, Air Force Academy, CO Jul 2014
Description: Training to learn how to be the one of the best college instructors.

Level III Certified Acquisition Professional Systems Planning, Research, Development and Engineering – Systems Engineering
Defense Acquisition University, Fort Belvoir, VA Feb 2013
Description: Leads and/or manages, or provides technical oversight of engineering activities in a functional specialty relating to the design, development, fabrication, installation, modification, sustainment, and/or analysis of systems or systems components.

Level III Certified Acquisition Professional in Systems Planning, Research, Development and Engineering – Science and Technology Manager
Defense Acquisition University, Fort Belvoir, VA Feb 2013
Description: Leads and/or manages science and technology activities including basic research, applied research and/or advanced technology development; may also provide direct support to acquisition program managers.

Squadron Officer School
Air University, Maxwell AFB, AL May 2013
Description: Education for Air Force Captains to think, communicate, cooperate, and lead in the joint environment.

Air & Space Basic Course
Air University, Maxwell AFB, AL Mar 2011

Description: Education for Air Force Lieutenants to think, communicate, cooperate, and lead in the joint environment.

PROFESSIONAL AFFILIATIONS

American Institute of Aeronautics and Astronautics (AIAA)	2008 – Present
Eta Kappa Nu, Electrical and Computer Engineering Honor Society	2011 – Present
Industry STEM Fellow for Dayton Regional STEM Center	2011 – 2014
Institute of Electrical and Electronics Engineers (IEEE)	2005 – Present
National Society of Professional Engineers (NSPE)	2012 – Present

PROFESSIONAL SERVICE

Small Business Innovation Research (SBIR) proposal reviewer in the area of Modeling and Simulation
U.S. Air Force and Air Force Office of Scientific Research 2011 - 2014

Conference Publications and Proceedings Paper Reviewer
Interservice/Industry Training, Simulation, & Education Conference (IITSEC) 2012

Deputy Session Chair "Electronic Attack: Cyber and Countermeasures"
Interservice/Industry Training, Simulation, & Education Conference (IITSEC) 2012

COMMUNITY SERVICE

Dayton Regional Science, Technology, Engineering and Mathematics (STEM) Center
Industry STEM Fellow, Dayton, OH 2011-2014
Description: Provide advancement of Science, Technology, Engineering, and Mathematics (STEM) education by inspiring student interest in STEM through the creation of two high school Modeling and Simulation (M&S) courses to equip the next generation workforce.

COMPUTER SKILLS

Programming: Assembly (x86, MSP430, and MIPS), Java, C/C++, VHDL

Applications: Adobe 3DS Max, Android Studio, Apache Subversion, Git Bash, Microsoft Office Suite, Unity 3D, Xilinx ISE & Vivado Design Suite, Altera Design Suite

Platforms: Windows, Windows Server, Linux, Android, iOS, Mac