

## Brent E. Eskridge, Ph.D.

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### Education

Ph.D. Computer Science, University of Oklahoma, 2009  
Dissertation: Effects of State and Action Abstraction on Development of Controllers for Concurrent, Interfering, Non-Episodic Tasks  
Advisor: Dean F. Hougen, Ph.D.

M.S. Computer Science, University of Oklahoma, 2004  
Thesis: Imitating Success in Genetic Programming with Memetic Crossover  
Advisor: Dean F. Hougen, Ph.D.

B.S. Physics and Mathematics, Southern Nazarene University, 1995, *Summa Cum Laude*

### Certifications

eLearnSecurity Junior Penetration Tester  
CompTIA Security+

### Interests

Cybersecurity, machine learning, programming, and artificial intelligence

### Funding: External Total: \$370,466

Brent E. Eskridge. *Research Stay for Academics: Predicting & Controlling Fission-fusion Events*, Budget Period: April 2019–May 2019; Sponsor: German Academic Exchange Service (DAAD - Deutscher Akademischer Austauschdienst); Amount: €6,125.

Brent E. Eskridge and Ingo Schlupp. *RI: SMALL: RUI: Fission-Fusion Multi-Robot Systems*, Budget Period: October 2016–September 2020; Sponsor: National Science Foundation; Amount: \$192,557. ([Link](#))

Brent E. Eskridge and Ingo Schlupp. *CDI TYPE-I: RUI: Emergent Hierarchies of Leaders in Multi-Robot Systems*, Budget Period: September 2011–August 2015; Sponsor: National Science Foundation; Amount: \$159,552. ([Link](#))

Brent E. Eskridge. *Research Opportunity Award: Nurturing Robotics*, Budget Period: May 2010–August 2010; Sponsor: Oklahoma EPSCoR, National Science Foundation; Amount: \$9,986.

Brent E. Eskridge. *NASA Ames Center Travel Grant*, Budget Period: Sept 2004–Jan 2005; Sponsor: Oklahoma NASA EPSCoR; Amount: \$1,500.

### Funding: Internal Total: \$9,550

Brent E. Eskridge. *Faculty Scholarship Support Grant (Deferred due to budget constraints)*, Budget Period: 10/29/15–06/30/16; Sponsor: Professional Development Council, Southern Nazarene University; Amount: \$1,500.

Brent E. Eskridge. *Research Support Grant*, Budget Period: 02/17/11–06/24/11; Sponsor: Catalysts, Southern Nazarene University Science and Mathematics Alumni Group; Amount: \$3,500.

Brent E. Eskridge. *Faculty Scholarship Support Grant*, Budget Period: 3/30/11–06/8/11; Sponsor: Professional Development Council, Southern Nazarene University; Amount: \$1,925.

Brent E. Eskridge. *Faculty Scholarship Support Grant*, Budget Period: 4/8/10–07/12/10; Sponsor: Professional Development Council, Southern Nazarene University; Amount: \$2,625.

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### Journal Publications

*Undergraduate student co-authors are underlined*

**Brent E. Eskridge**, Elizabeth Valle, and Ingo Schlupp. “Emergence of Leadership within a Homogeneous Group.” *PLoS One*, Volume 10, Number 7, pages e0134222, 2015. ([Paper](#))

**Brent E. Eskridge** and Dean F. Hougen. “Extending Adaptive Fuzzy Behavior Hierarchies to Multiple Levels of Composite Behaviors.” *Robotics and Autonomous Systems*, Volume 58, pages 1076–1084, 2010. ([Abstract](#))

**Brent Eskridge** and Dwight Neuenschwander. “A Pedagogical Model of Primordial Helium Synthesis.” *American Journal of Physics*. Volume 64, Issue 12, pages 1517–1524, 1996. ([Abstract](#))

### Refereed Book Chapters

**Brent E. Eskridge** and Dean F. Hougen. “Using State and Action Abstraction in Controllers for Concurrent, Interfering, Non-episodic Tasks.” In *Autonomous Agents*, I-Tech Education and Publishing, 2010. ([Chapter](#))

### Refereed Conference Publications

*Undergraduate student co-authors are underlined*

**Brent E. Eskridge**, and Ingo Schlupp. “Effects of Local Communication and Spatial Position in a Collective Decision-Making Model.” In *European Conference on Artificial Life (ECAL)*, pages 154–161, 2017. ([Paper](#))

**Brent E. Eskridge**, and Ingo Schlupp. “Effects of Personality Distribution on Collective Behavior.” In *International Conference on the Simulation and Synthesis of Living Things (ALife)*, pages 908–915, 2014. ([Paper](#))

Jeremy Acre, **Brent E. Eskridge**, Nicholas Zoller, and Ingo Schlupp. “Adapting to a Changing Environment Using Winner and Loser Effects.” In *Genetic and Evolutionary Computation Conference*, pages 137–144, 2014. ([Abstract](#))

Tim Solum, **Brent E. Eskridge**, and Ingo Schlupp. “Consensus Costs and Conflict in a Collective Movement.” In *Genetic and Evolutionary Computation Conference*, pages 49–56, 2014. ([Abstract](#))

**Brent E. Eskridge** and Dean F. Hougen. “Nurturing Promotes the Evolution of Learning in Uncertain Environments.” In *Joint IEEE International Conference on Development and Learning and on Epigenetic Robotics*, pages 1–6, 2012. ([Abstract](#))

Mark Woehrer, Dean F. Hougen, Ingo Schlupp, and **Brent E. Eskridge**. “Robot-to-robot Nurturing: A Call to the Research Community.” In *Joint IEEE International Conference on Development and Learning and on Epigenetic Robotics*, pages 1–2, 2012. ([Abstract](#))

**Brent E. Eskridge**. “Effects of Local Communication and Topology on Collective Movement Initiation.” In *International Conference on the Simulation and Synthesis of Living Things (ALife)*, pages 155–162, 2012. ([Paper](#))

**Brent E. Eskridge**. “Evolving a Follower in the Presence of a Potential Leader.” In *International Conference on the Simulation and Synthesis of Living Things (ALife)*, pages 163–170, 2012. ([Paper](#))

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**Brent E. Eskridge.** “Extrapolation of Regularity Using Indirect Encodings.” In *IEEE Congress on Evolutionary Computation*, pages 1280–1287, 2011. ([Abstract](#))

John Crofford, **Brent E. Eskridge** and Dean F. Hougen. “Applying the Triple Parameter Hypothesis to Maintenance Scheduling.” In *Genetic and Evolutionary Computation Conference*, pages 799–806, 2010. ([Abstract](#))

**Brent E. Eskridge** and Dean F. Hougen. “Using Action Abstraction to Evolve Effective Controllers.” *Genetic and Evolutionary Computation Conference*, pages 1773–1774, 2009. ([Abstract](#))

Nathaniel P. Troutman, **Brent E. Eskridge**, and Dean F. Hougen. “Is ‘Best-So-Far’ a Good Algorithmic Performance Metric?” *Genetic and Evolutionary Computation Conference*, pages 1147–1148, 2008. ([Abstract](#))

**Brent E. Eskridge** and Dean F. Hougen. “Using Priorities to Simplify Behavior Coordination.” *The International Joint Conference on Autonomous Agents and Multiagent Systems*, pages 1334–1336, 2007. ([Abstract](#))

**Brent E. Eskridge** and Dean F. Hougen. “Prioritizing Fuzzy Behaviors in Multi-robot Pursuit Teams.” *Proceedings of the IEEE Conference on Fuzzy Systems*, pages 6039–6045, 2006. ([Abstract](#))

**Brent E. Eskridge** and Dean F. Hougen. “An Analysis of Memetic Crossover’s Impact on a Population.” *IEEE Congress on Evolutionary Computation*, pages 6844–6850, 2006. ([Abstract](#))

**Brent E. Eskridge** and Dean F. Hougen. “Memetic Crossover for Genetic Programming: Evolution through Imitation.” *Genetic and Evolutionary Computation Conference*, pages 809–815, 2004. ([Abstract](#))

**Brent E. Eskridge** and Dean F. Hougen. “Imitating Success: Memetic Crossover for Genetic Programming.” *Congress on Evolutionary Computation*, pages 459–470, 2004. ([Abstract](#))

### Other Publications and Presentations

*Undergraduate student co-authors are underlined*

**Brent E. Eskridge**, Elizabeth Valle, and Ingo Schlupp. “Using Experience To Promote The Emergence Of Leaders And Followers.” European Conference on Complex Systems, 2013. (Poster) ([Extended Abstract and Poster](#))

**Brent E. Eskridge**, Elizabeth Valle, and Ingo Schlupp. “Bystander Effects In A Single-Player, Anonymous Contest.” European Conference on Complex Systems, 2013. (Poster) ([Extended Abstract and Poster](#))

Jeremy Acre, **Brent E. Eskridge**, and Nicholas Zoller. “Effects of Personality Decay on Collective Movements.” In *Student Workshop, Genetic and Evolutionary Computation Conference*, 2014. (Presentation and Poster)

Tim Solum, **Brent E. Eskridge**, and Ingo Schlupp. “Consensus Costs and Conflict in Robot Swarms.” In *Student Workshop, Genetic and Evolutionary Computation Conference*, 2014. (Presentation and Poster)

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**Brent E. Eskridge**, [Elizabeth Valle](#), and Ingo Schlupp. “Using Experience To Promote The Emergence Of Leaders And Followers.” European Conference on Complex Systems, 2013. (Poster) ([Extended Abstract and Poster](#))

**Brent E. Eskridge**, [Elizabeth Valle](#), and Ingo Schlupp. “Bystander Effects In A Single-Player, Anonymous Contest.” European Conference on Complex Systems, 2013. (Poster) ([Extended Abstract and Poster](#))

**Brent E. Eskridge**, [Blake Jordan](#), and Ingo Schlupp. “Effects of Conflict on Collective Movement Decision-Making.” European Conference on Complex Systems, 2013. (Oral presentation) ([Extended Abstract](#))

**Brent E. Eskridge**. “Effective (ab)use of HPC with Non-parallelized Software.” Oklahoma Supercomputing Symposium, Norman, OK, October 2010. (Invited speaker) ([Link](#))

**Brent E. Eskridge** and Dean F. Hougen. “Extending Adaptive Fuzzy Behavior Hierarchies to Multiple Levels.” Technical Report TR-OU-REAL-09-001, Department of Computer Science, University of Oklahoma. 2009.

[Nathaniel Troutman](#), **Brent E. Eskridge**, and Dean F. Hougen. “Evolving Artificial Neural Networks with Genetic Algorithms to Play Tic-Tac-Toe.” Oklahoma Research Day, April 2007. (Abstract and Poster)

**Brent E. Eskridge**. “Prioritizing Fuzzy Behavior Hierarchies to Improve Behavior Coordination.” *Doctoral Mentoring Program, The International Joint Conference on Autonomous Agents and Multiagent Systems*, pages 6–7, May 2007. (Refereed)

**Brent E. Eskridge** and Dean F. Hougen. “Prioritizing Behaviors in a Fuzzy Behavior Hierarchy.” *Second Annual Computer Science Research Conference*, University of Oklahoma Computer Science Graduate Student Association, April 2006. (Refereed, Honorable Mention Award)

Dean F. Hougen, Pedro A. Diaz-Gomez, **Brent E. Eskridge**. “Evolutionary Computation.” Research Experiences for Undergraduates Site on Embedded Machine Learning Systems, Seminar, July 19, 2005.

### Unpublished Presentations

**Brent E. Eskridge**. “Effects of Local Communication and Topology on Collective Movement Initiation.” Division of Science and Math Research Presentation Series, October 26, 2012.

**Brent E. Eskridge**. “Understanding Leadership in Robots by Understanding Leadership in Nature.” Division of Science and Math Research Presentation Series, October 3, 2011.

**Brent E. Eskridge**. “Fuzzy Logic.” PHIL-4193 Seminar in Philosophy: Logic, Southern Nazarene University, May 6, 2011. (Guest speaker)

**Brent E. Eskridge**. “What is Artificial Intelligence?” NS-3043 Science, Technology, and Society Course, Southern Nazarene University, October 27, 2009 and March 30, 2010. (Guest speaker)

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### Other Research Experience

NASA Space Grant SRE Advisor

2010–2012, 2014, 2016

Southern Nazarene University

Mentored lower-division undergraduate students in a NASA Space Grant funded summer research experience. Mentoring included introducing students to various aspects of research such as project organization, literature search, experimental design, and analysis of results. The program is intended to prepare students for participation in a REU program at a research university.

REU Faculty Mentor

2005–2010

Southern Nazarene University

Mentored undergraduate students participating in an NSF-funded Research Experience for Undergraduates (REU) program. Students performed research during the summer at the University of Oklahoma and continued their research at Southern Nazarene University during the academic year. Mentoring included aspects of research such as experimental design, analysis of results, and preparation of publications and presentations.

Graduate Research Assistant

2003–2006

Supervisor: Dean Hougen, Ph.D.

University of Oklahoma

Participated in an Army Research Office research project investigating learning at all levels within hierarchically organized multiagent robotic teams in an effort to improve coordination and task effectiveness.

Undergraduate Research Student

1994

Supervisor: Truell Hyde, Ph.D.

Baylor University

Participated in an NSF-funded Physics Research Experience for Undergraduates (REU) program in the field of space physics with a focus on solar system formation.

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### Academic Experience

Director, Esports, Southern Nazarene University, 2020–Present

Visiting Researcher, Max Planck Department of Collective Behaviour at the University of Konstanz, Germany, April 2019–May 2019

Professor, Southern Nazarene University, 2013–Present

Chair, Department of Computer Science/Network Engineering, Southern Nazarene University, 2013–Present

Curriculum Director, Software Development Degree Completion Program, Southern Nazarene University, 2010–2012

Associate Professor, Southern Nazarene University, 2009–2013

Assistant Professor, Southern Nazarene University, 2004–2009

Courses introduced:

Machine Learning (1)	Artificial Intelligence (1)
Operating Systems (8)	Intermediate OO Programming (7)
C/C++ Programming (5)	Object-Oriented Analysis and Design (9)
Software Engineering (7)	Computer Graphics (1)
Algorithm Analysis (2)	CS Practicum (12)
Problem Solving for Scientists (2)	Honors Colloquium: Cyberpunk (1)
Technology, Ethics & the Future (3)	Server-based Software Development (1)
Multi-Agent Systems (1)	

Courses taught:

Introduction to Computer Science I (17)	Introduction to Computer Science II (15)
Data Structures (17)	Computer Architecture (7)
Web Design (3)	Database Systems (9)
Network Administration I (9)	Network Administration II (7)
Integrated Software Applications (8)	Computer Applications for Business (1)
Computer Hardware and Networking (1)	

*Numbers indicate the number of times taught*

Teaching Assistant, Introduction to Computer Programming, University of Oklahoma, 2002–2003

### Related Professional Experience

Software Consultant, Co-owner 2000–2004  
els Solutions, LLC Oklahoma City, OK

In conjunction with my partners, we developed a web application server framework and interface with a multi-valued (non-SQL) database. I was primarily responsible for designing and implementing all the web application's interfaces to data storage. I also deployed web server software and updated the web application architecture to support customer change requests.

E–Application Developer 2000–2001  
The Netplex Group Edmond, OK

I performed analyses of customer requirements, designed and implemented a web application server framework, and integrated the web application with the customer's legacy systems.

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Software Engineer II 1997–2000  
Raytheon Systems Company Garland, TX  
I participated in two different programs. In the first, I developed an OO Perl/Tk application that was used as an engineering tool for inducing faults into software based device simulators. In the second program, I participated in the full life cycle development of a server application designed to control production machinery and a simulator designed to test the server.

Software Engineer 1995–1996  
North American Aviation, Rockwell International Tinker AFB, OK  
I maintained software for the landing gear subsystem of the B-1B Bomber CITS system, acted as primary reviewer of all engine subsystem work, and acted as the software team representative for numerous acceptance review meetings.

### **Honors and Awards**

Southern Nazarene University President’s Leadership Team: 2012–2015  
Southern Nazarene University Outstanding Alumni: 2009  
Doctoral Mentoring Program, International Joint Conference on Autonomous Agents and Multiagent Systems: 2007  
Student Paper Honorable Mention, Second Annual OU Computer Science Research Conference: 2006  
Student Poster Honorable Mention, Congress on Evolutionary Computation: 2004  
Spotlight Award, Raytheon Systems Company: 1998  
Charter Member, Sigma Pi Sigma, Physics Honor Society, Southern Nazarene University Chapter, inducted in 1995  
Outstanding Physics Student, Southern Nazarene University: 1995  
Phi Delta Lambda Member, International Honor Society for Graduates of Colleges and Universities of the Church of the Nazarene, inducted in 1995

### **Service**

Reviewer for Journal Evolutionary Computation  
Reviewer for Journal of Robotics and Autonomous Systems  
Reviewer for Journal of Machine Learning Special Issue  
Program Committee Member and Reviewer for Artificial Life Conference: 2012, 2014  
Reviewer for IEEE Congress on Evolutionary Computation: 2012  
Reviewer for NSF Robust Intelligence Award Program: 2017  
Reviewer for Genetic and Evolutionary Computation Conference (GECCO): 2007, 2008  
Host, ICPC International Collegiate Programming Contest: 2016, 2018, 2019  
Mentor, Bethany High School FIRST Robotics Team: 2015–2016, 2016–2017  
Mentor, Bethany Elementary Robotics Team: 2018–2019  
Advisor, Aksah Cherian’s Biosciences and Medicine Academy Senior Capstone Project, 2017  
Judge, Oklahoma Botball Tournament: 2012, 2014  
Member of Association for the Advancement of Artificial Intelligence

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Member of Association for Computing Machinery (ACM), Special Interest Group on Genetic and Evolutionary Computation

Member of Institute of Electrical and Electronics Engineers (IEEE)

Southern Nazarene University NASA Space Grant Summer Research Experience Responsible Conduct of Research Trainer: 2013–Present

Southern Nazarene University Undergraduate Research Symposium: Science Panel Moderator 2010, 2013, 2014; Poster Judge 2014, 2016

Southern Nazarene University Technology Advisory Committee: 2013–Present

Southern Nazarene University Storm Surge Summer Academic Advisor: 2012–Present

Southern Nazarene University Faculty Representative to the Board of Trustees: 2017–2018

Southern Nazarene University Faculty Professional Development Committee Chair: 2019–2021

Southern Nazarene University Faculty Professional Development Committee: 2014–2016

Southern Nazarene University Graduate Council: 2013–2014

Southern Nazarene University Faculty Senate, Science Division Representative: 2010–2012, 2019–2021

Southern Nazarene University Web Advisory Committee, Faculty Representative: 2010–2012

Southern Nazarene University NASA Space Grant Committee: 2009–Present

Southern Nazarene University Honors Advisory Council: 2009–2012

Southern Nazarene University Science Scholars Weekend: 2006–Present

Southern Nazarene University Rank Advancement Study Group: 2010–2011

Local Faculty Research Mentor for University of Oklahoma REU students: 2005–2009

SNU New Student Institute Faculty Mentor: 2004

Zone 12 Councilor, Society of Physics Students: 1994–1995

President, Society of Physics Students: 1994–1995

Vice-President, Society of Physics Students: 1993–1994