

D. Brian Larkins

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Education

- 2010 **Ph.D. Computer Science and Engineering**, *The Ohio State University, Columbus, OH*,
Dissertation: *Efficient run-time support for global view programming of linked data structures on distributed memory parallel systems*.
Advisor: P. Sadayappan
- 2008 **M.S. Computer Science**, *The Ohio State University, Columbus, OH*.
- 1996 **B.S. Computer Science**, *The Ohio State University, Columbus, OH*.

Professional Experience

- 2020 – present **Rhodes College**, *Associate Professor*, Mathematics and Computer Science.
Tenured position. Taught a variety of lower-level and upper-level computer science courses, conducted research in parallel computing, and performed service to the department and college.
- 2015 – 2020 **Rhodes College**, *Assistant Professor*, Mathematics and Computer Science.
Taught a variety of computer science courses and maintained an active research program.
- 2010 – 2015 **Coastal Carolina University**, *Assistant Professor*, Computer Science.
Awarded tenure and promoted to Associate Professor for Fall 2015.
Taught a variety of computer science courses, maintained an active research program.
- Spring 2010 **Capital University**, *Adjunct Professor*, Computer Science.
Teaching position. Taught an upper-level operating systems class to computer science majors.
- 2008 – 2010 **The Ohio State University**, *Graduate Teaching Associate*, Computer Science.
Taught and graded a variety of lower-level and upper-level computer science courses.
- 2005 – 2009 **The Ohio State University**, *Graduate Research Associate*, Computer Science.
Researched techniques for efficiently using irregular data structures such as trees and graphs on distributed-memory high-performance computing clusters.
- 2001-2004 **Counterstorm, Inc.**, *Lead Development Engineer*.
Designed and developed automated network intrusion detection systems built using advanced machine learning and data mining techniques to automatically identify network attacks. Developed extensible feature extraction engine for IP, TCP/UDP, and ICMP protocols.
- 2000-2001 **Starbak Communications**, *Director of Engineering*.
Lead design and development of a Real-Time Streaming Protocol (RTSP) media server from initial concept to first shipping version.
- 1996-2000 **Lucent Technologies, Bell Laboratories**, *Member of Technical Staff*.
Network Design & Architecture, Secure Web Infrastructure
Designed and implemented international IP routing architecture for corporate backbone and perimeter security networks. Designed and developed the security and network architecture for all corporate e-commerce applications.
- 1994-1996 **CDI Inc. / AT&T Bell Laboratories**, *Staff Engineer*, contractor.
Implemented a stable and scalable architecture for AT&T's external web presence. Administered several high-security / mission critical computer systems. Developed web site indexing software and search mechanism for www.att.com.

Honors and Awards

- 2021 **Clarence Day Award for Outstanding Teaching.**
Rhodes College highest honor and award for teaching excellence.
- 2004-present **Upsilon Pi Epsilon, ACM Honor Society for Computing and Information Disciplines, Faculty Advisor, Member.**
Served as Treasurer 2005-2006

Research Experience and Interests

Over the course of my career, my research focus has covered several areas of interest. While employed by Bell Laboratories, my work focused on Internet network architecture and web application security. My graduate work focused on programming models in high-performance computing (HPC) and has continued at both Coastal Carolina University (CCU) and Rhodes College.

My research has focused on the following areas:

- *Parallel Programming Models*: I have developed several models for working with irregular problems on distributed memory parallel computers. I have published work on models for working on distributed tree structures, dynamic load balancing, and the use of logical addressing within a partitioned global address space.
- *Parallel Compile-time and Run-time Systems*: I have developed several run-time systems for parallel systems. Systems such as Global Trees and the Scioto work-stealing system provide parallel programmers with higher-level abstractions for dealing with irregular, non-uniform problems. More recently, I have focused on accelerator offload support and network offload systems. At Ohio State, I worked on two compiler systems: *Brew*: a compiler and programming language with support for multiple dispatch, strong code mobility, and retroactive data abstraction and *TCE*: a domain-specific compiler which optimizes tensor contraction expressions and outputs highly-tuned FORTRAN code.
- *CS Education and K-12 STEM Intervention*: I developed a common platform for teaching the CS systems curriculum using field-programmable gate array (FPGA) hardware. I have worked to improve the introductory CS curriculum for non-major students. I have also investigated the application of formal learning frameworks (cognitive apprenticeship) to increase K-12 student interest and retention in STEM subjects.

Publications

Peer-Reviewed Conference Papers

- ICPP 2021 **Optimizing Work Stealing Communication with Structured Atomic Operations**, (*accept: 26%*). Hannah Cartier[†], James Dinan and D. Brian Larkins, 50th International Conference on Parallel Processing (ICPP '21). Chicago, IL., August 9-12, 2021. DOI 10.1145/3337821.3337878
- ICPP 2019 **Accelerated Work Stealing**, (*accept rate: 26%*). D. Brian Larkins, John Snyder[†], and James Dinan, 48th International Conference on Parallel Processing (ICPP '19). Kyoto, JP, August 5-8, 2019. DOI 10.1145/3337821.3337878
- ICPP 2018 **Efficient Runtime Support for a Partitioned Global Logical Address Space**, (*accept rate: 29%*). D. Brian Larkins, John Snyder[†], and James Dinan, 47th International Conference on Parallel Processing (ICPP '18). Eugene, OR, August 13-16, 2018. DOI: 10.1145/3225058.3225092
- COMHPC 2016 **Extending a Message Passing Runtime to Support Partitioned, Global Logical Address Spaces**, (*34.8%*). D. Brian Larkins, James Dinan, First International Workshop on Communication Optimizations in High Performance Computing (COMHPC '16). Salt Lake City, UT, November 18, 2016. DOI: 10.1109/COMHPC.2016.007

[†] denotes an undergraduate co-author.

- ACMSE 2014 **GPU Acceleration of the Advanced Regional Prediction System (ARPS)**, (36%).
Benjamin A Whetstone[†], Varavut Limpasuvan, D. Brian Larkins, 52nd ACM Southeast Conference (ACMSE'14). Kennesaw, GA, March 28-29, 2014. DOI: 10.1145/2638404.2735458
- ACMSE 2012 **Improving Data Locality for Irregular Partitioned Global Address Space Programs**, (57%).
D. Brian Larkins, 50th ACM Southeast Conference (ACMSE '12). Tuscaloosa, AL, March 29-31, 2012. DOI: 10.1145/2184512.2184577
- SC 2009 **Scalable Work Stealing**, (23%).
James Dinan, Sriram Krishnamoorthy, D. Brian Larkins, Jarek Nieplocha P. Sadayappan. 21st ACM/IEEE Conference on High Performance Computing (SC '09) Portland, OR, November 14-20, 2009. DOI: 10.1145/1654059.1654113
- SC 2008 **Global Trees: A Framework for Linked Data Structures on Distributed Memory Parallel Systems**, (21%).
D. Brian Larkins, James Dinan, Sriram Krishnamoorthy, Atanas Rountev, P. Sadayappan. 20th ACM/IEEE Conference on High Performance Computing (SC '08) November 2008.
- ICPP 2008 **Scioto: A Framework for Global-View Task Parallelism**, (accept rate: 30.8%).
James Dinan, D. Brian Larkins, Jarek Nieplocha, P. Sadayappan. 37th International Conference on Parallel Processing (ICPP '08) Portland, OR, September 8-12, 2008. DOI: 10.1109/ICPP.2008.44
- LISA 1999 **Internet Routing and DNS Voodoo in the Enterprise**.
D. Brian Larkins. 13th Conference on Large Installation Systems Administration (USENIX LISA '99). Seattle, WA, November 7-12 1999.

Peer-Reviewed Conference Papers – Pedagogy

- CCSC-MS 2018 **Evaluating Computer Science Camp Topics in Increasing Girls' Confidence in Computer Science**.
Hannah Chipman[†], Haley Adams, Betsy Sanders, and D. Brian Larkins, 16th Annual Consortium of Computing Sciences Mid South (CCSC-MS 18). Memphis, TN, April 6-7, 2018.
- SIGCSE 2013a **Using FPGAs As a Reconfigurable Teaching Tool Throughout CS Systems Curriculum**, (37.9%).
D. Brian Larkins, William M. Jones, H. Erin Rickard, 44th ACM Technical Symposium on Computer Science Education (SIGCSE '13). Denver, CO, March 6-9, 2013. DOI: 10.1145/2445196.2445316
- SIGCSE 2013b **Application of the Cognitive Apprenticeship Framework to a Middle School Robotics Camp**, (37.9%).
D. Brian Larkins, J. Christopher Moore, Louis J. Rubbo, Laura R. Covington[†], 44th ACM Technical Symposium on Computer Science Education (SIGCSE '13). Denver, CO, March 6-9, 2013. DOI: 10.1145/2445196.2445226
- ACMSE 2011a **Targeting FPGA-based Processors for an Implementation-Driven Compiler Course**, (50%).
D. Brian Larkins, William M. Jones, 49th ACM Southeast Conference (ACMSE '11). Kennesaw, GA, March 24-26, 2011. DOI: 10.1145/2016039.2016056
- ACMSE 2011b **Integrating Digital Logic Design and Assembly Programming Using FPGAs in the Classroom**, (50%).
William M. Jones, D. Brian Larkins. 49th ACM Southeast Conference (ACMSE '11). Kennesaw, GA, March 24-26, 2011. DOI: 10.1145/2016039.2016053
- WTCS 2010 **Introductory Computational Science Using MATLAB and Image Processing**.
D. Brian Larkins, William Harvey. Procedia Computer Science, 1(1):913-919, June 2010. DOI: 10.1016/j.procs.2010.04.100

Refereed Abstracts and Posters

- ACM SIGCSE 2015 **E-Assess: A Web-Based Tool for Coordinating and Managing Program Assessment**.
Jean H. French, D. Brian Larkins. Peer-reviewed, published abstract.

[†] denotes an undergraduate co-author.

- ACM SIGCSE 2014 **Making Use of the Cognitive Apprenticeship Framework in an Undergraduate Robotics Course.**
D. Brian Larkins. Peer-reviewed, published abstract.
- ACM SIGCSE 2012 **Using FPGA Systems Across the Computer Science Curriculum.**
D. Brian Larkins, H. Erin Rickard, William M. Jones. Peer-reviewed, published abstract.
- Ohio Nanotechnology Summit 2005 **Nanospectroscopy of Materials and Biomedicine at Fundamental Atomic and Molecular Scales.**
Michael K. Mrozik, Russell Pitzer, Justin Oelgoetz, Max Montenegro, Sultana N. Nahar, Anil Pradhan, D. Brian Larkins, P. Sadayappan, Werner Eissner
- [Peer-Reviewed Workshops](#)
- ACM SIGCSE 2012 **Introduction to Using FPGAs in the Computer Science Curriculum,** Led a half-day workshop training CS educators to use FPGA systems in CS curriculum design.
William M. Jones, D. Brian Larkins

Invited Talks and Professional Presentations

- 2021 "Optimizing Work Stealing Communication with Structured Atomic Operations." 50th International Conference on Parallel Processing. August 2021. Chicago, IL.
- 2021 "Research Computing at Rhodes College." Greater Memphis IT Council. April 2021. Memphis, TN.
- 2020 "Distributed Load Balancing in OpenSHMEM." Faculty Development Endowment Talks. September 2018. Memphis, TN.
- 2020 "Building the Culture and Infrastructure for Research Computing in the Liberal Arts." Open Science Grid All-Hands Meeting. September 2020.
- 2019 "Accelerated Work Stealing." 48th International Conference on Parallel Processing. August 2019. Kyoto, JP.
- 2018 "Hardware Accelerated Distributed Load Balancing." Faculty Development Endowment Talks. November 2018. Memphis, TN.
- 2018 "Mis-using Network Hardware to Build Efficient Parallel Systems." Computer Science Department Seminar at the University of Mississippi. October 2018. Oxford, MS.
- 2018 "Efficient Runtime Support for a Partitioned Global Logical Address Space." 47th International Conference on Parallel Processing. August 2018. Eugene, OR.
- 2017 "Extending a Message Passing Runtime to Support Partitioned, Global Logical Address Spaces." Intel Research. March 2017. Hudson, MA.
- 2017 "TUPLE-D: Efficient Coordination Language Implementation for Parallel Supercomputing Systems." Faculty Development Endowment Talks. February 2017. Memphis, TN.
- 2016 "Extending a Message Passing Runtime to Support Partitioned, Global Logical Address Spaces." 1st Int'l Workshop on Communication Optimizations in High Performance Computing. November 2016. Salt Lake City, UT.
- 2015 "Massive Parallelism: Peeking Into the Future of Computing Performance." Rhodes College Department Seminar. January 2015. Memphis, TN.
- 2015 "Improving the State of Parallel Program Development." Computer Science Department Seminar at Vassar College. December 2015. Poughkeepsie, NY.
- 2014 "GPU Acceleration of the Advanced Regional Prediction System (ARPS)." 52nd ACM Southeast Conference. March 2014. Kennesaw, GA.

- 2013 "Using FPGAs as a Reconfigurable Teaching Tool Throughout CS Systems Curriculum." 44th ACM Technical Symposium on Computer Science Education. March 2013. Denver, CO.
- 2013 "Application of the Cognitive Apprenticeship Framework to a Middle School Robotics Camp." 44th ACM Technical Symposium on Computer Science Education. March 2013. Denver, CO.
- 2012 "Improving Data Locality for Irregular Partitioned Global Address Space Programs." 50th ACM Southeast Conference. March 2012. Tuscaloosa, AL.
- 2011 "Integrating Field-Programmable Gate Array (FPGA) Devices Across the Computer Science Curriculum." Grand Strand Technical Expo, November 2011. Myrtle Beach, SC.
- 2011 "From Here to There: How Packets Get Pushed Around the Internet." CS Department Faculty Colloquium Series at Coastal Carolina University. February 2011. Conway, SC.
- 2010 "Global Irregular Data Structures on Parallel Distributed Memory Systems." Computer Science Seminar at Coastal Carolina University. February 2010. Conway, SC.
- 2009 "Global Trees: Support for Parallel Distributed Data Structures." Computer Science Department Seminar at Moravian College. November 2009. Bethlehem, PA.
- 2008 "Global Trees: A Framework for Linked Data Structures on Distributed Memory Parallel Systems." 20th ACM/IEEE Conference on High Performance Computing. November 2008. Austin, TX.
- 1999 "Internet Routing and DNS Voodoo in the Enterprise." 13th Conference on Large Installation Systems Administration. November 1999. Seattle, WA.

Mentored Undergraduate Research Presentations

- Rhodes Symposium **OpenSHMEM Accelerated Work Stealing.**
- 2021 Hannah Cartier. Rhodes College Undergraduate Research Symposium, Poster, Memphis, TN, April 2021.
- URCAS 2018 **Lockless Distributed Work Stealing.**
- John Snyder. Rhodes College Undergraduate Research and Creative Activities Symposium (URCAS '18), Poster, Memphis, TN, April 2018.
- URCAS 2018 **Offloading Active Messages to Hardware in a Partitioned Global Logical Address Space.**
- John Snyder. Rhodes College Undergraduate Research and Creative Activities Symposium (URCAS '18), Presentation, Memphis, TN, April 2018.
- ACM-MSE 2010 **Image Segmentation Using the MAP-MRF Model and Contour Map Displacement Labels.**
- Neva Waynesboro. ACM Mid-Southeast 2010 Conference. Gatlinburg, TN, Nov. 11-12 2010.

Conferences

- *International Conference for High Performance Computing Networking, Storage, and Analysis (SC)* 2008, 2011, 2016, 2017, 2018, 2019.
- *International Conference on Parallel Processing (ICPP)* 2018, 2019, 2021.
- *ISC High Performance (ISC)* 2016.
- *ACM Special Interest Group on CS Education (SIGCSE) Technical Symposium* 2012, 2013, 2014, 2015, 2016.
- *ACM South East Regional Conference (ACM-SE)* 2011, 2012, 2014.
- *Consortium for Computing Sciences in Colleges Mid-South Conference* 2016.
- *Workshop on Patterns in High Performance Computing (patHPC)* 2005.
- *USENIX Large Installation System Administration Conference (LISA)* 1999.
- *Internet Engineering Task Force Meeting (IETF)* 1998.

- *USENIX UNIX Security Symposium 1995.*

Sponsored Research

Funded External Awards

- 2020 **Campus Champion Renewal for Rhodes College,**
XSEDE (NSF Extreme Science and Engineering Discovery Environment), PI.
Awarded 357,600 hours of compute time on six high-performance computing systems (*TRA160031*)
- 2020 **Supporting Parallel Computing CS Education at Rhodes College III,**
XSEDE (NSF Extreme Science and Engineering Discovery Environment), PI.
Awarded 50,000 hours of compute time on the Comet supercomputer (*TG-CIE160009*)
- 2020 **CC* Compute: A High Performance Computing Cluster to Accelerate Research, Education and Training at Rhodes College, \$389,660,** NSF, PI.
Requested funds to purchase a high-performance computing cluster for use as a centralized research computing resource. (*Award# 2018758*)
- 2019 **Campus Champion Renewal for Rhodes College, \$6,665 (XSEDE est.),**
XSEDE (NSF Extreme Science and Engineering Discovery Environment), PI.
Awarded 357,600 hours of compute time on six high-performance computing systems (*TRA160031*)
- 2019 **High-Performance Dynamic Load Balancing, \$932.00,**
XSEDE (NSF Extreme Science and Engineering Discovery Environment), PI.
Awarded 50,000 hours of compute time on the Comet supercomputer (*TG-ECS170009*)
- 2019 **Supporting Parallel Computing CS Education at Rhodes College III, \$1,082,**
XSEDE (NSF Extreme Science and Engineering Discovery Environment), PI.
Awarded 60,000 hours of compute time on the Comet supercomputer (*TG-CIE160009*)
- 2018 **Accelerating Irregular Data Accesses with Active Messages in OpenSHMEM,** National Energy Research Scientific Computing (NERSC), U.S. Department of Energy, PI.
Awarded 100,000 hours of compute time on two petascale supercomputing systems (*m3190*)
- 2018 **Campus Champion Renewal for Rhodes College, \$13,500 (XSEDE est.),**
XSEDE (NSF Extreme Science and Engineering Discovery Environment), PI.
Awarded 362,000 hours of compute time on six high-performance computing systems (*TRA160031*)
- 2017 **High-Performance Distributed Data Structures, \$1,841,**
XSEDE (NSF Extreme Science and Engineering Discovery Environment), PI.
Awarded 50,000 hours of compute time on the Comet supercomputer (*TG-ECS170009*)
- 2017 **Supporting Parallel Computing CS Education at Rhodes College II, \$1,841,**
XSEDE (NSF Extreme Science and Engineering Discovery Environment), PI.
Awarded 50,000 hours of compute time on the Comet supercomputer (*TG-CIE160009*)
- 2016 **Compute Resources for Campus Champions at Rhodes College, \$25,450 (XSEDE est.),**
XSEDE (NSF Extreme Science and Engineering Discovery Environment), PI.
Awarded 509,000 hours of compute time on seven high-performance computing systems
- 2016 **Supporting Parallel Computing CS Education at Rhodes College, \$2,500 (XSEDE est.),**
XSEDE (NSF Extreme Science and Engineering Discovery Environment), PI.
Awarded 50,000 hours of compute time on two high-performance computing systems
- 2014 **Compute Resources Renewal for Campus Champions, \$23,300 (XSEDE est.),**
XSEDE(NSF Extreme Science and Engineering Discovery Environment), PI.
Awarded 233,000 hours of compute time on six high-performance computing systems
- 2014 **Supporting Parallel Computing CS Education at CCU, \$4,800 (XSEDE est.),**
XSEDE (NSF Extreme Science and Engineering Discovery Environment), PI.
Awarded 48,000 hours of compute time on two high-performance computing systems

- 2014 **NVIDIA GPGPU Academic Partnership Program, \$10,600**, NVIDIA Research, PI.
Awarded two high-end K40 GPGPU processor cards for scientific computing research
- 2013 **Compute Resources for Campus Champions at CCU, \$48,300 (XSEDE est.)**, XSEDE (NSF Extreme Science and Engineering Discovery Environment), PI.
Awarded 483,000 hours of compute time on seven high-performance computing systems
- 2012 **AMD GPGPU Academic Hardware Donation, \$600**, AMD Research, PI.
Awarded one high-end GPGPU processor card for scientific computing research
- 2012 **NVIDIA CUDA Teaching Center Award, \$5,045**, NVIDIA Research, Co-PI.
Awarded six high-end GPGPU processor cards for scientific computing education
- 2012 **NVIDIA GPGPU Academic Partnership Program, \$4,400**, NVIDIA Research, PI.
Awarded two high-end GPGPU processor cards for scientific computing research
- 2011 **LittleFe Parallel Computing Mini-Cluster, \$6,817**, Shodor Education Foundation, PI.
Awarded a distributed-memory parallel cluster and travel support for attending Supercomputing 2011 conference in Seattle, WA

Funded Internal Awards

- 2021 **Hardware Accelerated Parallel Programming Models, \$5000**, Mid-Career Scholarship Fund, Rhodes College, PI.
Awarded to develop new research opportunities related to the HPC cluster awarded to Rhodes.
- 2020 **Re-Envisioning the CS Curriculum at Rhodes College, \$10,092**, Hill Development Fund, Rhodes College, Co-PI.
Award to redesign the CS curriculum at Rhodes College
- 2020–present **Parallel Computing Fellowship, \$5,344**, Rhodes College Fellowship Fund, PI.
Awarded summer funding for an undergraduate to work on an optimized HPC load balancing system
- 2020 **Faculty Development Endowment Grant, \$5,000**, Faculty Development Committee, Rhodes College, PI.
Awarded funding for research into parallel dynamic load balancing with OpenSHMEM
- 2019 **Parallel Computing Fellowship, \$3,676**, Rhodes College Fellowship Fund, PI.
Awarded summer funding for an undergraduate to work on an OpenSHMEM load balancing system
- 2018 **Faculty Development Endowment Grant, \$5,000**, Faculty Development Committee, Rhodes College, PI.
Awarded funding for research into distributed-memory parallel dynamic load balancing
- 2018 **Data Analytics at Rhodes College, \$3,876**, Hill Development Fund, Co-PI.
Award to develop a Data Analytics major at Rhodes College
- 2016 **Parallel Computing Fellowship, \$1,100**, Rhodes College Fellowship Fund, PI.
Awarded two semesters of funding for an undergraduate to work on a distributed hash table
- 2016 **Faculty Development Endowment Grant, \$5,000**, Faculty Development Committee, Rhodes College, PI.
Awarded funding for research on parallel programming models
- 2012 **Professional Enhancement Grant, \$2,628**, Coastal Carolina University, PI.
Awarded funding for undergraduate student research

Funded Internal Travel Awards

- 2014 **CCU College of Science Professional Activities Mini-Grant, \$850**.
Award for travel to SIGCSE 2014 conference in Atlanta, GA
- 2014 **CCU College of Science Professional Activities Mini-Grant, \$400**.
Award for travel to ACM SE 2014 conference in Atlanta, GA

- 2012 **CCU College of Science Professional Activities Mini-Grant, \$1,825.**
Award for travel to SIGCSE 2013 conference in Denver, CO
- 2011 **CCU College of Science Professional Activities Mini-Grant, \$1,250.**
Award for travel to SIGCSE 2012 in Raleigh, NC and ACMSE 2012 conference in Tuscaloosa, AL
- 2011 **CCU College of Science Professional Activities Mini-Grant, \$400.00.**
Award for travel to ACM SE 2011 conference in Kennesaw, GA
- 2008 **Ohio State CSE Department Travel Award, \$1,200.**
for travel to Supercomputing 2008 conference in Austin, TX

Unfunded External Proposals

- 2014 **ACM SIGCSE Special Project Award, \$5,000,** ACM Special Interest Group on CS Education, PI.
Requested support to development education modules for teaching compiler construction
- 2012 **Silicon Mechanics Research Cluster Grant, \$50,000,** Silicon Mechanics, PI.
Requested award of a GPU and CPU-based parallel research cluster for weather simulation
- 2011 **NSF EPSCoR RII Track-2, \$165,000,** NSF, PI.
Requested funds to create a center for scientific computing at Coastal Carolina University and equip a 1,000+ core parallel computing cluster. Recommended for funding, but unfunded due to program cancellation
- 2011 **NASA SBIR Subtopic A4.02, \$7,000,** NASA, Co-PI, subcontract.
Requested funds to develop software to assist in automated damage assessment of composite material systems

Teaching Interests

Throughout my career in academia, I have taught at all levels of the undergraduate computer science curriculum. My teaching interests have focused on the following areas:

- *Computer Systems:* I enjoy computer systems and have been responsible for the majority of the systems curriculum at Rhodes, teaching computer organization every semester and operating systems annually. I have also taught these courses at Coastal Carolina and Capital University. My experience from industry has given me a broad background in this area – including networking, computer security, and systems software development that I strive to include in my teaching.
- *Parallel and High-Performance Computing:* With my research specialization in high-performance computing (HPC), I am enthusiastic about sharing my experience and perspectives on performance with undergraduates. My industry background has had me look for learning opportunities outside the classroom, such as giving assignments that require students to solve real-world problems using large-scale supercomputing systems.
- *Programming Languages:* My research has focused on both compile-time and run-time systems within HPC. I have brought this background into the classroom through programming languages and compiler implementation courses. I taught the required programming language / compiler implementation sequence at CCU and have taught compilers as an upper-level elective at Rhodes. I have also utilized this experience when teaching theory of computation – drawing parallels between theoretical constructs such as Turing machines and pragmatic tools like compilers.
- *Introductory CS:* I am passionate about teaching students new to computer science and have taught a total of seven CS1/CS2 sections (mostly CS2) at both institutions. I have developed introductory courses that have been more systems-focused using C/C++, object-oriented in focus with Java, and application-focused using MATLAB.

- *CS for K-12 Students*: In addition to teaching in a formal undergraduate setting, I am deeply committed to cultivating interest and self-confidence in computer science and STEM fields. Prior to graduate school, I mentored high school students in computer science for eight years. Since then, I have participated, developed and led a total of nine summer camps focusing on building CS and STEM interest. I have continued this work at Rhodes by leading Camp Codette, a summer camp for middle and high school girls over the past four years.

Teaching Experience

2015 – present

Rhodes College, Associate Professor.

COMP 142: Computer Science II, Instructor of Record.

Introduction to fundamental concepts computer science, data abstraction, and algorithmic design.

COMP 231: Computer Organization, Instructor of Record.

Introduction to computer organization, architecture, and assembly language programming.

COMP 315: Computer Networks, Instructor of Record.

Introduction to computer network communication, protocols, routing, and security.

COMP 330: Operating Systems, Instructor of Record.

Introduction to fundamental concepts of operating systems: processes, scheduling, synchronization, and memory management.

COMP 350: Theory of Computation, Instructor of Record.

Introduction to theoretical models of computing. Finite state automata, Turing machines, decidability, complexity theory and NP-Completeness.

COMP 360: Programming Languages, Instructor of Record.

Introduction to concepts and issues of programming language design and implementation.

COMP 380/465: Introduction to Parallel Systems, Instructor of Record.

Organization and architecture of parallel systems, decomposition, and programming models.

COMP 465: Special Topics – Principles of Compiler Design, Instructor of Record.

Design and implementation of modern high-level language compilation systems.

2010 – 2015

Coastal Carolina University, Assistant Professor.

CSCI 130: Introduction to Computer Science, Instructor of Record.

Introduction to fundamental concepts and an overview major topics in computer science.

CSCI 140/140L: Introduction to Algorithmic Design I, Instructor of Record.

Introduction to fundamental concepts of computer science and algorithmic design.

CSCI 150/150L: Introduction to Algorithmic Design II, Instructor of Record.

Introduction to fundamental concepts computer science, data abstraction, and algorithmic design.

CSCI 210: Computer Organization and Programming, Instructor of Record.

Introduction to computer organization, architecture, and assembly language programming.

CSCI 350: Organization of Programming Languages, Instructor of Record.

Introduction to concepts and implementation issues of programming language design.

CSCI 356: Operating Systems, Instructor of Record.

Introduction to fundamental concepts of operating systems: processes, scheduling, synchronization, and memory management.

CSCI 450: Principles of Compiler Design, Instructor of Record.

Design and implementation of modern high-level language compilation systems.

CSCI 473: Introduction to Parallel Systems, Instructor of Record.

Organization and architecture of parallel systems, parallel task and data decomposition, performance analysis, and parallel programming models.

- CSCI 485: Introduction to Robotics**, Instructor of Record.
Introduction to concepts and realization of robotic systems.
- Spring 2010 **Capital University**, Adjunct Professor.
CS 380: Operating Systems, Instructor of Record.
Introduction to operating systems design, implementation, and distributed systems.
- 2008 – 2010 **The Ohio State University**, Graduate Teaching Associate.
CSE 294P: Computational Thinking in Context: Science and Engineering,
Instructor of Record.
Introduction to scientific computing using MATLAB.
- CSE 201: Elementary Computer Programming**, Instructor of Record.
Introduction to computer programming using Java.
- 1993 – 2001 **Associate Advisor/Instructor**, *Explorer Post 891 / Learning for Life*.
Taught weekly courses year-round in a program sponsored by AT&T Bell Laboratories designed to introduce and educate high-school students about basic computer science concepts. Taught classes on basic computer literacy, programming in C, Java, Scheme, network architecture, web development, and computer security. Students were all from Columbus, OH area public schools and had no previous training in computer science.

Activities and Service

University/College Service

- 2020 – present **Coronavirus Task Force, Health & Safety Subcommittee**, *Rhodes College*.
- 2019 – present **Institutional Review Board**, *Rhodes College*.
- 2018 – 2021 **Faculty Professional Interest Committee**, *Rhodes College*.
- 2018 – present **Upsilon Pi Epsilon**, *Rhodes College*, ACM/IEEE CS honor society, faculty advisor.
- 2015 – present **XSEDE Campus Champion**, *Rhodes College*.
Assist students and faculty with using high-performance computing resources as apart of the NSF-funded Extreme Science and Discovery Environment.
- 2014 – 2015 **Curriculum Committee, College of Science, Chair**, *Coastal Carolina University*.
- 2013 – 2015 **XSEDE Campus Champion**, *Coastal Carolina University*.
- 2012 **Search Committee – Associate VP Sponsored Research**, *Coastal Carolina University*.
- 2012 – 2015 **Curriculum Committee, College of Science**, *Coastal Carolina University*.
- 2011 – 2015 **Technology Committee, College of Science**, *Coastal Carolina University*.
- 2011 **Long Range Planning Committee, College of Science**, *Coastal Carolina University*.
- 2011 **New Faculty Orientation, Mentor**, *Coastal Carolina University*.

Departmental Service

- 2018 – 2019 **Strategic Planning Committee**, *Math and Computer Science, Rhodes College*.
- 2013 **Lecturer Search Committee, Chair**, *Computer Science and Information Systems, Coastal Carolina University*.
- 2013 **Assistant Professor Search Committee**, *Computer Science and Information Systems, Coastal Carolina University*.
- 2012 **Lecturer Search Committee, Dept of Physics and Chemistry**, *Coastal Carolina University*.
- 2011 – 2015 **CS ABET Assessment Committee**, *Coastal Carolina University*.

- 2010 – 2015 **CS Curriculum Committee**, *Coastal Carolina University*.
- 2010 – 2011 **CS Technology Infrastructure Committee**, *Coastal Carolina University*.
- 2012 – 2015 **ABET Course Assessment Coordinator**
- CSCI 150: Introduction to Algorithmic Design II
 - CSCI 150L: Introduction to Algorithmic Design II Lab
 - CSCI 350: Organization of Programming Languages
 - CSCI 356: Operating Systems
 - CSCI 370: Data Communication Systems and Networks
 - CSCI 450: Principles of Compiler Design
- 2009 – 2010 **CS Curriculum Committee**, *The Ohio State University*, Graduate Representative.
- 2008 – 2009 **Graduate Admissions Committee**, *The Ohio State University*, Graduate Representative.

Service to the Community / Outreach

- 2016–present **Camp Codette**, Teaching middle school girls how to program during an annual summer 1-2 week summer camp.
- 2013 **Lake City, SC Robotics Demonstrations**, Conducted a robotics demonstration at Ronald E. McNair Middle School and Lake City College Preparatory Academy to increase STEM awareness for rural South Carolina K-12 students.
- 2012-2015 **CCU Robocamp**, Mentored middle school students to build robotic systems for a two-week half-day summer camp.
- 2012-2015 **FIRST LEGO League Program at Ocean Bay Elementary School**, Mentored 3rd-5th grade girls and boys to build robotic systems to participate in a district-wide robotics competition.
- 2012 **FIRST Robotics Competition Program at Conway High School**, Mentored high school students to build a robot designed to participate in a national robotics competition.
- 2009 **Future Engineers Summer Camp**, *The Ohio State University*.
Assisted with activity development and supervision of a workshop introducing computer science concepts to 8th-grade girls.
- 2009 **Engineers in Motion Summer Camp**, *The Ohio State University*.
Assisted with activity development and supervision of a workshop introducing computer science concepts to female high school students.

Professional Service

- 2011–present **ACM Tech. Symp. for Computer Science Education (SIGCSE)**, Prog. Committee.
- 2018 **International Conference on Parallel Processing (ICPP)**, Ph.D. Forum Mentor.
- 2017–2018 **ACM Transactions on Architecture and Code Optimization (TACO)**, Reviewer.
- 2013 **Int'l Workshop on High-Level Parallel Programming Models and Supportive Environments (HIPS)**, Reviewer.
- 2012–2013 **ACM Annual Conference on Innovation and Technology in Computer Science Education (ITiCSE)**, Reviewer.
- 2012 **IEEE International Conference on Parallel and Distributed Systems (ICPADS)**, Reviewer.
- 2012 **IEEE/ACM Int'l Symposium on Cluster, Cloud and Grid Computing (CCGrid)**, Reviewer.
- 2011 **International Conference on Supercomputing (ICS)**, Reviewer.
- 2011 **Int'l Conference on Computer Communication Networks (ICCCN)**, Reviewer.

Honors

- 2004-present **Upsilon Pi Epsilon**, *Honor Society for Computing and Information Disciplines*, Member.
Served as Treasurer 2005-2006
- 2009 **Eleanor Quinlan Memorial Award for Graduate Student Teaching**, *Nominee*.
Nominated by former students and department faculty for the Department of Computer Science and Engineering teaching award.
- 2009 **The Ohio State University Graduate Associate Teaching Award**, *Nominee*.
Nominated by former students and faculty for a university-wide graduate teaching award.

Affiliations

Member, *Association for Computing Machinery (ACM)*.

Member, *ACM Special Interest Group on High Performance Computing (ACM SIGHPC)*.