BIOGRAPHICAL SKETCH AND PROFESSIONAL ACTIVITIES
RENSSELAER POLYTECHNIC INSTITUTE
April 19, 2022

I. Personal Data

Name: Christopher D. Carothers
Current Rank: Professor
Department: Computer Science
School: Science

October, 2012 - Present	Director, Center for Computational Innovations
June, 2010 - Present	Professor in Department of Computer Science
May, 2008 - Oct, 2012	Associate Head of Computing for Computer Science
May, 2004 - June,2010	Associate Professor in Department of Computer Science
August, 1998 - May, 2014	Assistant Professor in Department of Computer Science

Date of Birth: March 19, 1968

Education Preparation

Ph.D., Computer Science	Georgia Institute of Technology, September 1997
M.S., Computer Science	Georgia Institute of Technology, December 1996.
B.S., Information and Computer Science	Georgia Institute of Technology, December 1991

II. Professional Experience

January, 2018 – Present	**Academic Adviser** BOSS AI (formerly LUCD), `askboss.ai`
October, 2005 – December, 2007	**Consultant, Member of Research Staff** General Electric, Research Center
January, 1997 – August, 1998	**Research Scientist**, Georgia Institute of Technology
June, 1996 – September, 1996	**Member of Technical Staff**, MITRE Corporation
June, 1993–October, 1993	**Member of Technical Staff**, Bellcore
June, 1994–September, 1994	**Member of Technical Staff**, Bellcore
January, 1992–March, 1997	**Research Assistant**, Georgia Tech Research Institute

III. Director, Center for Computational Innvotions

The mission of the CCI is the advancement of science and engineering discovery through the use of massively parallel computation and data analytics. Currently,

the CCI supports the research activities of nearly 40 Rensselaer faculty including both the Dean of Engineering and Dean of Science. A number of these faculty members are supported by the NSF CAREER award program.

IV. Teaching

A. Courses

Date		Number	Title	Enrollment
2022	Spring	CSCI-4320/6340	Parallel Comp. & Prog.	78
2021	Spring	CSCI-4320/6340	Parallel Comp. & Prog.	56
2020	Fall	CSCI-2500	Computer Organization	270
2020	Spring	CSCI-4320/6340	Parallel Comp. & Prog.	130
2019	Spring	CSCI-4320/6340	Parallel Comp. & Prog.	110
2018	Spring	CSCI-4320/6340	Parallel Comp. & Prog.	110
2017	Spring	CSCI-4320/6340	Parallel Comp. & Prog.	110
2016	Spring	CSCI-4320/6340	Parallel Comp. & Prog.	105
2015	Spring	CSCI-6968/4971	Adv. in Supercomputing	13
2014	Spring	CSCI-4320/6340	Parallel Comp. & Prog.	70
2013	Spring	CSCI-4320/6340	Parallel Comp. & Prog.	75
2012	Fall	CSCI-2500	Computer Organization	85
2012	Spring	CSCI-4320/6340	Parallel Comp. & Prog.	63
2011	Fall	CSCI-2500	Computer Organization	67
2011	Spring	CSCI-4320/6340	Parallel Comp. & Prog.	61
2010	Fall	CSCI-2500	Computer Organization	92
2010	Spring	CSCI-4320/6340	Parallel Comp. & Prog.	50
2009	Fall	CSCI-2500	Computer Organization	93
2009	Spring	CSCI-4320/6340	Parallel Comp. & Prog.	50
2008	Fall	CSCI-2500	Computer Organization	80
2008	Spring	CSCI-6964	High-Perf. Par. Dist. Comp.	20
2008	Fall	CSCI-2500	Computer Organization	77
2007	Spring	Special Leave		
2006	Fall	CSCI-2500	Computer Organization	60
2006	Spring	Sabbatical Leave		
2005	Fall	Sabbatical Leave		
2005	Spring	CSCI-4972/6962	Parallel Distributed Simulation Systems	8
2004	Fall	CSCI-4250	Computer Architecture	32
2004	Spring	CSCI-4250	Computer Architecture	40
2003	Fall	No Course	On Parental Leave	
2003	Spring	CSCI-2500	Computer Organization	66
2002	Fall	CSCI-4966/6965	Parallel Distributed Simulation Systems	19
2002	Spring	CSCI-2500	Computer Organization	70
2001	Fall	CSCI-4966/6965	Parallel Distributed Simulation Systems	31

Date		Number	Title	Enrollment
2001	Spring	CSCI-2500	Computer Organization	92
2000	Fall	CSCI-4964/6964	Parallel Distributed Simulation Systems	43
2000	Spring	CSCI-2500	Computer Organization	85
1999	Fall	CSCI-2500	Computer Organization	170
1999	Spring	CSCI-2500	Computer Organization	56
1998	Fall	CSCI-2500	Computer Organization	92

B. **Student Thesis Supervision**

a. **Bachelors**
Undergraduate Research Program (URP)

1. **Andrew Zonenberg**, *Massively Parallel Security Hash-Cracker Using GPUs*. Andrew is constructing what appears to be the one of the worlds fastest if not the fastest hash-cracker systems in the world. Using CUDA on a cluster of seven GPUs (GTX 280s), his system can do 2.1 billion MD5 hash-guesses per second. He is still attempting to improve the performance. *Completed Fall 2009*
2. **Richard Alimi**, *Real-time Detection and Termination of Buffer of Overflow Attacks*. Rich will be developing a new suit of algorithms to be inserted at the system call level of the operating system that will be able to efficiently detect and terminate "buffer overflow" security holes from being used to gain access or corrupt a computer system. *Completed Spring 2005*.
3. **Darling Garcia, and Ron Sze**, *Efficient, Parallel Simulation of the Border Gateway Protocol (BGP)*. Darling and Ron are implementing the BGP Internet routing protocol in our ROSS/ROSS.NET parallel simulation framework. This work is co-advised by Dr. S. Kalyanaraman. *Completed Spring 2004*.
4. **Benjamin Roghani**, *Efficient Parallel Virtual Environments*. Ben is designing a new virtual environment system that leverages state-of-the-art graphics hardware. In particular, he is attempting to develop a new method for doing soft shadowing that will improve the state-of-the-art. *Completed Spring 2004*.
5. **Fred Smith**, *Emulation of Network Protocols Using Existing Source Code Implementations*. Fred will be taking open source network protocols, such as TCP/IP and pulling them out of the OS and running them directly as part of a simulation/ emulation framework. *Completed Spring 2002.*
6. **Mike Peters**, *Perfectly Reversible Parallel Simulation*. Mike designed new algorithms that will enable models to be executed in a perfectly reversible mode of operation (i.e., no state saving). Mike transitioned to the CS M.S. program, completed his M.S. Thesis and is now working at Sandia National Labs. *Completed January 2004.*

7. **Shawn Pearce**, *High-Performance, Real-Time File System.* Shawn is developing a new file system architecture will that enable the reading and writing of data with hard real-time deadlines at a sustained rate of 100 MB/sec and will scale to 1 GB/sec using commodity based hardware. *Completed Fall 2002.*
8. **Shawn Pearce**, *ROSS Parallel Simulation Project.* Shawn developed the data structure and computing architecture for ROSS. This work resulted in two publications, one conference and one journal. Shawn is a co-author on those publications. *Completed Summer 1999.*
9. **Vinny Paceri**, *Mapping the World Wide Web.* Vinny is developing efficient techniques to explore the Internet to ascertain a measure of its size. *Completed Fall 1999.*
10. **Justin Lapre**, *Real-time Spatial Mapping and Referencing of Retinal Images*, Justin is developing a new technique for realizing an embedded real-time system from an existing code base as well as enabling a more efficient memory paging system. *Completed Spring 2003.*
11. **Justin Lapre**, *Linux / Segmented Virtual Memory Project*, Justin was developing a new virtual memory management scheme that will utilize segments on the Pentium-III architecture. *Completed Spring 2000.*
12. **Max Berman**, *Configurable Application View Storage.* Max was responsible for developing an initial simulation model of the view storage architecture. *Completed Spring 2000.*
13. **David Bauer**, *ROSS Parallel Simulation Project.* David developed the computing architecture and core scheduling algorithm for ROSS. This worked results in two publications, one conferences and one journal. David is a co-author on those publications and has since transitioned to the CS PhD program. *Completed Summer 1999.*

b. **Masters**

Graduated Students with Masters Thesis

1. **Deyang Gu**, "Implementation of A Vectorized Version of Klein-Nishina Equation on Intel Xeon Phi Coprocessor", Major: Computer Science, May 2014, Current Employeer: Bloomberg.
2. **Cody Gallagher**, "An Agent-Based Model for Large-Scale Parallel Simulation of Natural Disasters in Towns and Cities: Path Finding and Preprocessing", Major: Computer Science, May, 2013. Current Employer: Cisco
3. **Curtis Antolik**, "An Agent-Based Model for Large-Scale Parallel Simulation of Natural Disasters in Towns and Cities: Civilians and Power", Major: Computer Science, May, 2013. Current Employer: Palantir
4. **Mark Anderson**, "Photon Mapping for Simulation of Electromagnetic Signal Propagation in the Industrial-Scientific-Medical Frequency Bands", Major: Computer Science, August, 2012. Current Employer: Consultant

5. **Thomas Reale**, "Data Routing with Wireless Sensor Networks". Major: Computer Science, December, 2011. Current Employer: Viasat.
6. **Timothy B. Wickberg**, "The RAMdisk Storage Accelerator – A Method of Accelerating I/O Performance on HPC Systems Using RAMdisks". Major: Computer Science, December, 2011. Current Employer: SchedMD – Chief Technology Officer.
7. **Jing Fu**, "Parallel I/O Solutions for Large-Scale Partitioned Solver Systems". May, 2010. Current Employer: Uber
8. **Justin Lapre**, "Process-Level Parallelization of Spatial Referencing". May, 2005. Current Employer: RPI/RA.
9. **Mike Peters**, "An Algorithm for Fully-Reversible Optimistic Parallel Simulation". January, 2004. Current Employer: Sandia National Labs.

Students with Masters Thesis In Progress

1. None at this time.

Graduated Students with Masters Project

1. **Larry Bush, May 2003**, "Large-Scale Modeling and Simulation of Hot Potato Routing in Sensor Networks".
2. **Ying "Vicky" Guo, May 2002**, "Multicast Network Models Using Reverse Computation".
3. **Alexei V. Zheglov, May 1999**, "A Study of SNMP MIB Design and Implementation".

c. **Doctoral**

Research Associates / Postdocs

1. **Neil McGlohon**, Software Engineer, February 2020 – Present.
2. **Noah Wolfe**, Computer Scientist, August 2015 – December 2018.
3. **Justin LaPre**, Computer Scientist/Lecturer, May 2014 – December, 2017.
4. **Elsa Gonsiorowski**, Computer Scientist, May 2014 – July, 2016.
5. **David Bauer**, Postdoc, May 2005 – December 2005.

Graduated Students with Ph.D.

1. **Neil McGlohon, June 2021**, "Exploration of Communication Interconnection Network Congestion and Methods of Mitigation Through Effective Simulation", Major: Computer Science, Current Employer: RPI/CCI.
2. **Mark Plagge, August 2020**, "Extreme-Scale Neuromorphic Architecture Modeling Using Massively Parallel Optimistic Simulation", Major: Computer Science, Current Employer: Sandia National Labs (SNL).
3. **Caitlin Ross, August 2019**, "Performance Analysis and Visualization Tools to Support The Codesign of Next Generation Computer Systems", Major: Computer Science, Current Employer: Kitware, Clifton Park, NY.
4. **Prasanna Date, August 2019**, "Combinatorial Neural Network Training Algorithm for Neuromorphic Computing", Major: Computer Science, Current Employer: DOE, Oak Ridge National Laboratory (ORNL).

5. **Noah Wolfe, December 2018**, "Evaluating Next Generation HPC Interconnection Networks", Major: Computer Science, Current Employer: Advanced Microdevices (AMD) Research.
6. **Chander Iyer, May 2018**, "Randomized Algorithms for Mining Massive Matrices: Design & Implementation at Terascale and Beyond", Co-Advised by P. Drineas (Purdue), Major: Computer Science, Current Employer: Oath.
7. **Elsa Gonsiorowsi, December 2015**, "Enabling Extreme-Scale Circuit Modeling Using Massively Parallel Discrete-Event Simulations", Major: Computer Science, Current Employer: DOE, Lawrence Livermore National Labs (LLNL).
8. **Justin LaPre, December 2015**, "Advanced Optimizations For Large-Scale Parallel Discrete-Event Simulations", Major: Computer Science, Current Employer: Rensselaer Polytechnic Institute.
9. **Misbah Mubarak, January 2014**, "Using Parallel Simulation For Extreme-scale Networks AND Storage Systems Co-Design", Major: Computer Science, Current Employer: Amazon Web Services (AWS).
10. **Jing Fu, August 2012**, "Parallel I/O Optiminations for Large-Scale Scientific Applications", Major: Computer Science, Current Employer: Uber.
11. **Akintayo Holder, August 2011**, "The Impact of Irregularity on Efficient Large-Scale Integer-Intensive Computing", Major: Computer Science, Current Employer: Google, NYC.
12. **Ryan LaFortune, May 2008**, "Techniques and Data Structures for Efficient Information Access in Distributed Networks", Co-Advised by C. Busch. Major: Computer Science, Current Employer: MITRE, Bedford MA.
13. **Bouchra Bouqata, September 2006**, "Using Data Mining to Improve HMM Estimation and Complexity", Co-Advised by B. K. Szymanski and M. J. Zaki. Major: Computer Science, Current Employer: General Electric, Corporate Research and Development Center, Niskayuna NY.
14. **David Bauer, December 2005**, "Meta-Simulation Design and Analysis for Large-Scale Networks", Major: Computer Science, Current Employer: CTO Lucd, Inc., Mclean, VA.
15. **Garrett Yaun, May 2005**, "Efficient Large-Scale Computer Systems and Network Modeling Using Optimistic Parallel Simulation", Major: Computer Science, Current Employer: Google, San Jose CA.

Students with Ph.D. In Progress

1. **Elkin Cruz:** Thesis under development. Working in the area of massively parallel simulations of neuromorphic processors using supercomputer systems. Elkin has passed his PhD course qualifications.

Ph.D. Thesis Committee Membership – Completed

1. **Jacob Merson, November 2021**, "Mechanics of network materials using discrete network models and GPU accelerated multiscale finite elements", Rensselaer, MANE, Adviser: C. Picu and M. Shephard.
2. **Evan Maicus, May 2021**, "Automated Grading for Advanced Topics Courses", Rensselaer, Computer Science, Adviser: Barbara Cutler.
3. **Jingpeng Hao, April 2021**, "Improve Speed Performance of Mass Data Storage Systems", Rensselaer, Electrical and Computer Systems Engineering, Adviser: Tong Zhang.
4. **Xubin Chen, May 2020**, "System Architecture for High Performance Solid-State Data Storage Devices", Rensselaer, Electrical and Computer Systems Engineering, Adviser: Tong Zhang.
5. **Prateek Kumar Singh, December 2019**, "Reliable and Trustworthy Networks in Ad-Hoc and Edge Networks", Rensselaer, Electrical and Computer Systems Engineering, Adviser: Koushik Kar.
6. **Fan Yang, December 2019**, "A Parallel and Adaptive Interface-Tracking Approach for Evolving Geometry Problems", Rensselaer, MANE, Adviser: O. Sahni.
7. **Kareem Sherif Aggour, May 2019**, "Intelligent and Scalable Algorithms for Canonical Polyadic Decomposition", Rensselaer, Computer Science, Adviser: Y. Yener.
8. **William Reading Tobin, August 2019**, "The Adaptive Multisclae Simulation Infrastructure", Rensselaer, Computer Science, Adviser: M. Shephard.
9. **Salles Viana Gomes de Magalhaes, December 2017**, "Exact and Parallel Intersection of 3D Triangular Messhes", Rensselaer, Electrical and Computer Systems Engineering, Adviser: W. R. Franklin.
10. **Konstantin Kuzmin, December 2017**, "New Approaches to Efficienct Structural Analysis of Social and Biological Networks", Rensselaer, Computer Science, Adviser: B. Szymanski.
11. **Xin Lin, May 2017**, "Prediction Limit of Cascades in Interconnected Models" Rensselaer, Computer Science, Adviser: B. Szymanski.
12. **Cameron Smith, May 2017**, "Tools and Techniques for Parallel Unstructured Mesh-Based Adaptive Workflows", Rensselaer, Computer Science, Adviser: M. Shephard.
13. **Hao Wang, May 2017**, "Architecting Memory Systems Upon Highly Scaled Error-Prone Memory Technologies", Rensselaer, Electrical and Computer Systems Engineering, Adviser: T. Zhang.
14. **Dan Ibanez, December 2016**, "Adapting Conformal Meshes on Heterogeneous Supercomputers", Rensselaer, Computer Science, Electrical and Computer Systems Engineering, Adviser: M. Shephard.
15. **Ibrahim Kouada , December 2016**, "Multirate Digital Signal Processing for Time Interleaved Analog to Digital Converters", Rensselaer,

Electrical and Computer Systems Engineering, Adviser: J. McDonald.

16. **Ying Lu, May 2016**, "A Framework for Comparision of Methods for Solving Complementarity Problems That Arise in Multibody Dynamics", Rensselaer, Computer Science, Adviser: J. Trinkle.
17. **Wenli Li, May 2016**, "GPU-Accelerated Terrain Processing", Rensselaer, Electrical and Computer Systems Engineering, Adviser: W. R. Franklin.
18. **Xuebin Zhang, May 2016**, "Domain-specific Solid-state Data Storage Systems Design", Rensselaer, Electrical and Computer Systems Engineering, Adviser: T. Zhang.
19. **Joshua Nasman, January 2016**, "Designing, Implementing, and Evaluating Intuitive & Interactive Lighting Simulation Tools", Renssleaer, Computer Science, Adviser: B. Cutler.
20. **Christian Schenkelberg, December 2015**, "Novel Computational Methods for Modeling Backbone Flexibility and Improving Side-Chain Prediction for Protein Design Applications", Rensselaer, Biochemistry and Biophysics, Adviser: C. Bystroff.
21. **Srikumar Raman, December 2015**, "Serial Code Acceleration with Single-ISA Asymmetric Multi-core Processor", Rensselaer, Electrical and Computer Systems, Adviser: J. F. McDonald.
22. **Ryan Clarke, August 2015** , "High-Speed Serial Circuits Using SiGE HBT BiCMOS Technology", Rensselaer, Electrical and Computer Systems, Adviser: J. F. McDonald.
23. **Jie Chen, July 2015**, "Energy Efficient Hardware and Software Solutions for Wireless Network Access on Two Line", Rensselaer, Electrical and Computer Systems Engineering, Adviser: B. Sikdar.
24. **Andrew Zonenberg, May 2015**, "Antikernel: A Decentralized Secure Hardware-Software Operating System Architecture", Renssleaer, Computer Science, Adviser: B. Yener.
25. **Kai Zhao, December 2014**, "Circuits and Systems for Solid-state Data Storage Using Highly Scaled NAND Flash Memory", Rensselaer, Electrical and Computer Systems, Adviser: T. Zhang.
26. **Syed Yousaf Shah, December 2014**, "Dynamic Management of Network Systems", Renssleaer, Computer Science, Adviser: B. K. Szymanski.
27. **Wei Huang, April 2014**, "Inference and Checking Framework for Context-Sensitive Pluggable Types", Renssleaer, Computer Science, Adviser: A. Milanova.
28. **Li "Emma" Zhang, December 2013**, "Data-Driven Grasping and Dynamics-Empowered Real-Time State Estimation for Dexterous Manipulation", Renssleaer, Computer Science, Adviser: J. Trinkle.
29. **Adam Beece, May 2013**, "Improving Computer System Performance and Power with 3D Integration and Memory", Rensselaer, Electrical and Computer Systems Engineering, Adviser: J. Lu.

30. **Jesse Weaver, May 2013**, "Toward Webscale, Rule-Based Infreence on the Semantic Web Via Data Parallelism", Rensselaer, Computer Science, Adviser: J. Hendler.
31. **Muhammad Naveed Aman, December 2012**, "Channel-Aware Protocols For Wireless Networks", Rensselaer, Electrical and Computer Systems Engineering, Adviser: B. Sikdar.
32. **Akeksandr Ovcharenko, September 2012**, "Parallel Anisotropic Mesh Adaptation with Boundary Layers", Rensselaer, Computer Science, Adviser: M. Shephard.
33. **Sahin Cem Geyik, August 2012**, "Network Data Modeling Via Grammatical Structures", Rensselaer, Computer Science, Adviser: B. K. Szymanski.
34. **Ting Xie, August 2012**, "Mesh Data Management Components for Petascale Adaptive Unstructured Mesh Based Simulations", Rensselaer, Mechanical, Aerospace and Nuclear Engineer, Adviser: M. Shephard.
35. **Yangyang Pan, May 2012**, "System Architecture Design for High Performance 3D Memory System and Solid State Drive Storage System", Rensselaer, Electrical and Computer Systems Engineering, Adviser: T. Zhang.
36. **Yiran Li, May 2012**, "Memory-Centric Low Power Digital System Design", Rensselaer, Electrical and Computer Systems Engineering, Adviser: T. Zhang.
37. **Bo Zhang, May 2012**, "Agent-based Discrete-Event Simulation and Optimization of Regional Transportation Evacuation", Rensselaer, Industrial and Systems Engineering, Adviser: V. Chan.
38. **Qi Wu, December 2011**, "Design Techniques to Facilitate the Adoption of Emerging Memory Technologies in Computing Systems", Rensselaer, Electrical and Computer Systems Engineering, Adviser: T. Zhang,
39. **Tuhin Neogi, August 2011**, "Design of a High-Speed and Compact Electro-optic Modulator using SiGe HBT", Rensselaer, Electrical and Computer Systems Engineering, Adviser: J. F. McDonald.
40. **Binh Nguyen, August 2011**, "Locally Nonconvex Contact Models and Solution Methods for Accurate Physical Simulation in Robotics", Rensselaer, Computer Science, Adviser: J. Trinkle.
41. **Eyuphan Bulut, May 2011**, "Opportunistic Routing Algorithms in Delay Tolerant Networks", Rensselaer, Computer Science, Adviser: B. K. Szymanski.
42. **Philip Jacob, August 2010**, "Serial Code Accelerators for Heterogeneous Multi-core Processor with 3D memory", Rensselaer, Electrical and Computer Systems Engineering, Adviser: J. F. McDonald.
43. **Xiang Luo, December 2009**, "Dynamic Channel Assignment and Power Allocation Strategies in Multi-Channel Wireless Networks", Rensselaer, Electrical and Computer Systems Engineering, Adviser: K. Kar.

44. **Dawei Ni, December 2009**, "Arbitrary-Order Impulse-Response (IR) Moment Extraction in RLC Interconnect Networks: A Novel Stochastic Algorithm", Rensselaer, Electrical and Computer Systems Engineering, Adviser: Y. LeCoz.
45. **Tiffany Lam, December 2009**, "A Stochastic, Abritrary-Order Impluse-Response Moment-Extraction Algorithm for Uncoupled RC Interconnect Networks", Rensselaer, Electrical and Computer Systems Engineering, Adviser: Y. LeCoz.
46. **Min Zhou, August 2009**, "Petascale Adaptive Computational Flud Dynamics", Rensselaer, Mechanical, Aerospace and Nuclear Engineering, Adviser: K. Jansen.
47. **Aamir Zia, August 2009**, "High-Performance Memory Systems using 3-D IC Technology", Rensselaer, Electrical and Computer Systems Engineering, Adviser: J. McDonald.
48. **Jin-Woo Kim, August 2009**, "SiGe High Speed Crossbar Switch for Digital Signal Router and Phased Array Antenna Systems", Rensselaer, Electrical and Computer Systems Engineering, Adviser: J. McDonald.
49. **Yang Liu, December 2008**, "Low-Power Circuit and System Design in Nanoelectronics Regime", Rensselaer, Electrical and Computer Systems Engineering, Adviser: Y. LeCoz.
50. **Anil Kumar Karanam, August 2008**, "A P-Adaptive Stabilized Finite Element Method for Fluid Dynamics", Rensselaer, Computer Science, Adviser: K. Jansen.
51. **Paul Belemjian, August 2008**, "High Speed Adder Design Using BiCMOS SiGe Technology", Rensselaer, Electrical and Computer Systems Engineering, Adviser: J. McDonald.
52. **Vijay Subramanian, May 2008**, "Transport and Link-Level Protocols for Wireless Networks and Extreme Environments", Rensselaer, Electrical and Computer Systems Engineering, Adviser: S. Kalyanaraman.
53. **Juong-Sik Lee, May 2007**, "Recurrent Auctions in E-Commerce", Rensselaer, Computer Science (CS), Adviser: B. K. Szymanski.
54. **Young Uk Yim, December 2006**, "High Speed Serial Data Transmission Integrated Circuits with Half-Rate Clock and Quarter-Rate Clock in SiGe BiCMOS Technology" Rensselaer, Electrical and Computer Systems Engineering, Adviser: J. McDonald.
55. **Okan Erdogan, December 2006**, "A Three-Port Pipelined Register File Implemented Using a SIGe HBT BiCMOS Technology", Rensselaer, Electrical and Computer Systems Engineering, Adviser: J. McDonald.
56. **Yongqiang Zhang, August 2006**, "Structured Motifs in Biological Sequences: Localization and Extraction", Rensselaer, Computer Science (CS), Adviser: M. J. Zaki.
57. **Hua Yang, August 2005**, "Architectures for Application-Oriented Information Dissemination in Ad-Hoc Sensor Networks", Rensselaer, Elec-

trical and Computer Systems Engineering , Adviser: B. Sikdar.

58. **David Levermore, August 2005**, "Global Database Query in Collaborative Environments", Rensselaer, Decision Sciences, Adviser: Cheng Hsu.
59. **Omesh Tickoo, May 2005**, "End-to-End Solutions for Real-Time Transmission Over Resource Deficient Networks", Rensselaer, Electrical and Computer Systems Engineering, Adviser: S. Kalyanaraman.
60. **Chi-nan Chiang, July 2005**, "An Information-Theoretic Approach to Storage Management for Middleware Caching", Rensselaer, Computer Science (CS), Adviser: S. Adali.
61. **Huaming Wu, June 2005**, "Supporting Multimedia Applications in Resource Constrained Multihop Wireless Networks", Rensselaer, Electrical and Computer Systems Engineering, Adviser: A. Abouzeid.
62. **Yu Juan (Annie) Zeng, January 2005**, "Wafer-Level Three-Dimensional Cache Architecture Design For Memory-Intensive Applications", Rensselaer, Electrical and Computer Systems Engineering, Advisers: R. J. Gutmann and K. Rose.
63. **Xingzhe Fan, December 2005**, "Robust Nonlinear Control Designs for Communications Networks", Rensselaer, Electrical and Computer Systems Engineering, Adviser: M. Arcak.
64. **Jun Peng, August 2004**, "Multicast Congestion Control and Loss Recovery with Network Assistance", Rensselaer, Electrical and Computer Systems Engineering, Adviser: B. Sidkar.
65. **Yu Liu, July 2004**, "Loosely Coordinated, Distributed Network Simulation", Rensselaer, Computer Science, Adviser: B. K. Szymanski.
66. **Kartikeya Chandrayana, May 2004**, "Novel Placement of Congestion Control Functions in the Internet", Rensselaer, Electrical and Computer Systems Engineering, Adviser: S. Kalyanaraman.
67. **Stephen L. Fitzhugh, April 2004**, "Explicit Rate Congestion Management for Packet Switched Networks", Rensselaer, Electrical and Computer Systems Engineering, Adviser: S. Kalyanaraman.
68. **Li Jiang, July 2003**, "End-To-End Multicast Congestion Control and Avoidance", Rensselaer, Computer Science, Adviser: S. Kalyanaraman.
69. **Tao Ye, March 2003** , "Adaptive Optimization of Network Protocols Using On-line Simulation", Rensselaer, Electrical and Computer Systems Engineering, Adviser: S. Kalyanaraman.
70. **Jason Liu, January 2003**, "Improvements in Conservative Parallel Simulation of Large-Scale Models", Dartmouth College, Computer Science, Adviser: D. Nicol.
71. **Gang Chen, January 2003**, "Component-Based Simulation", Rensselaer, Computer Science, Adviser: B. K. Szymanski.
72. **David Harrison, December 2001**, "Edge-to-Edge Traffic Control for the Internet", Rensselaer, Computer Science, Adviser: S. Kalyanaraman.

73. **Erman Coskun, July, 2001**, "The Impact of Complexity in Embedded Intelligent Real-Time System", Rensselaer, Engineering Science, Advisers: M. Grabowski and D. Berg.
74. **Hong Shin, December 1999**, "Progress Redundant Vision Algorithms for Real-time Spatial Referencing Application to Laser Retinal Surgery", Rensselaer, Electrical and Computer Systems Engineering, Advisers: B. Roysam, and C. Stewart.

Ph.D. Thesis Committee Membership – In Progress

1. **Alexander Chen**, "On-Chip Photonic Systems for Machine Learning Applications", Rensselaer, Physics, December, 2021, Adviser: R. Huang (ECSE).

C. **Course and Curriculum Development**

In 2000, introduced a senior undergraduate/graduate course in parallel and distributed simulation systems. Course has been offered during the Fall 2000, Fall 2001, Fall 2002 and Spring 2005. In Spring 2008, I offered a new introductory course in High-Performance Parallel and Distributed Computing. This course will re-used the existing course the Computer Science department offers called Parallel Computing at the undergraduate 4000 level and Parallel Programming at the graduate level. In Spring 2015, I offered a new follow-on course to Parallel Computing and Programming that focuses on recent advances in supercomputing.

V. Publications

A. Book Chapters

1. "Exascale Scientific Applications: Scalability and Performance Portability", Edited by T. P. Straatsma, K. B. Antypas, T. J. Williams, "Chapter 15: Extreme Scale Unstructured Adaptive CFD for Aerodynamic Flow Control", K. E. Jansen, M. Rasquin, J. Brown, C. Smith, M. S. Shephard and **C. D. Carothers**, pages 319–344, CRC Press, Taylor & Francis Group, 2018.

B. Agency Workshop Reports

1. "Research Challenges in Modeling & Simulation for Engineering Complex Systems", National Science Foundation Workshop Report, Jan. 13 – 14, 2016, 153 pages. Report Authorship: *Introduction and Concluding Remarks:* R. M. Fujimoto and M. Loper, *Applications:* W. Rouse and P. Zimmerman, *Conceptual Models:* C. Bock, F. Dandashi, S. Friedenthal, N. Harrison, S. Jenkins, L. McGinnis, J. Sztipanovits, A. Uhrmacher, E. Weisel, L. Zhang, *Computational Issues:* **C. D. Carothers**, A. Ferscha, R. M. Fujimoto, D. Jefferson, M. Loper, M. Marathe, S. Taylor, H. Vakilzadian, *Uncertainty:* W. Chen, G. Kesidis, T. Morrison, T. Oden, J. Panchal, C. Paredis, M. Pennock, S. Russcher, G. Terejanu, M. Yukish, *Reuse:* O. Balci, G. L. Ball, K. L. Morse, E. Page, M. D. Petty, S. N. Veautour.

2. "The Future of Scientific Worflows", Report of the DOE NGNS/CS Scientific Workflows Workshops, April 20-21, 2015. *Meeting Organizers:* E. Deelman (USC) (co-organizer), T. Peterka (ANL) (co-organizer), I. Altintas (SDSC), **C. D. Carothers (RPI)**, K. K. van Dam (PNNL). `http://science.energy.gov/~/media/ascr/pdf/programdocuments/docs/workflows_final_report.pdf`.
3. Adolfy Hoisie (PNNL, Chair), Darren Kerbyson (PNNL), Robert Lucas (USC/ISI), Arun Rodrigues (Sandia), John Shalf (LBNL), Jeffrey Vetter (ORNL), Kevin Barker (PNNL), Jim Belak (LLNL), Greg Bronevetsky (LLNL), **Chris Carothers (RPI)**, Boyana Norris (ANL), Sudhakar Yalamanchili (GT), "Report on the ASCR Workshop on Modeling and Simulation of Exascale Systems and Applications", August 9 – 10, 2012, University of Washington Seattle, WA.

C. **Refereed Articles**

1. **In refereed JOURNAL (articles which are reviewed by peers in the field prior to publication).**
   (a) **Major Articles**
   1. N. Wolfe, M. Mubarak, **C. D. Carothers**, R. B Ross, P. Carns, "Modeling Large-Scale Slim Fly Networks Using Parallel Discrete-Event Simulation", In *ACM Transactions on Modeling and Computing Simulation*, part of Special Issue on *Best of 2016 ACM-SIGSIM-PADS Conference*, Volume 28 Issue 4, page 29:1–29:25, October 2018.
   2. M. Plagge, **C. D. Carothers**, E. Gonsiorowski and N. McGlohon, "NeMo: A Massively Parallel Discrete-Event Simulation Model for Neuromorphic Architectures", In *ACM Transactions on Modeling and Computing Simulation*, part of Special Issue on *Best of 2016 ACM-SIGSIM-PADS Conference*, pages 30:1–30:25, October 2018.
   3. E. Deelman, T. Peterka, I. Altintas, **C. D. Carothers**, Kerstin Kleese van Dam, Kenneth Moreland, Manish Parashar, Lavanya Ramakrishnan, Michela Taufer, and Jeffrey Vetter. "The Future of Scientific Workflows." In *The International Journal of High Performance Computing Applications*, volume 32, no. 1 (January 2018), pages 159–175.
   4. E. Gonsiorowski and **C. D. Carothers**, "Automatic Model Generation for Gate-Level Circuit PDES with Reverse Computation", In *ACM Transactions on Modeling and Computer Simulation*, Special Issue on Best of the 2015 ACM-SIGSIM-PADS Conference, pages 12:1–12:23, Volume 27, Issue 2, July, 2017.
   5. M. Mubarak, **C. D. Carothers**, R. B. Ross and P. Carns, "Enabling Parallel Simulation of Large-Scale HPC Network Systems", *IEEE Transactions on Parallel and Distributed Systems (TPDS)*, Volume 28, Number 1, Pages 87–100, January, 2017.
   6. C. Iyer, H. Avron, G. Kollias, Y. Ineichen, **C. D. Carothers** and P. Drineas, "A Randomized Least Squares Solver for Terabyte-sized Dense

Overdetermined Systems", In *Journal of Computational Science (JOCS)*, 2016 Elsevier. http://www.sciencedirect.com/science/article/pii/S1877750316301508

7. T. Liu, N. Wolfe, **C. D. Carothers**, W. Ji, and G. Xu, "Optimizing the Monte Carlo Neutron Cross-Section Construction Code XSBench for MIC and GPU Platforms", *Nuclear Science and Engineering*, Volume 185, January, 2017. http://www.ans.org/pubs/journals/nse/a_39010
8. E. Deelman, **C. D. Carothers**, A. Mandal, B. Tierney, J. S. Vetter, I. Baldin, C. Castillo, G. Juve, D. Krol, V. Lynch, B. Mayer, J. Meredith, T. Proffen, P. Ruth, R. Ferreira da Silva,"PANORAMA: An Approach to Performance Modeling and Diagnosis of Extreme Scale Workflows". *International Journal of High Performance Computing Applications*, July, 2015. URL: http://hpc.sagepub.com/content/early/2015/07/13/1094342015594515.abstract
9. T. Liu, G. Xu, and **C. D. Carothers**, "Comparison of Two Accelerators for Monte Carlo Radiation Transport Calculations, NVIDIA Tesla M2090 GPU and Intel Xeon Phi 5110p Coprocessor: A Case Study for X-ray CT Imaging Dose Calculation", *Annals of Nuclear Energy*, Volume 82, Page 230–239, August, 2015.
10. N. Liu, **C. D. Carothers**, J. Cope, P. Carns and R. Ross, "Model and Simulation of Exascale Communication Networks", In *Journal on Simulation*, Volume 6, 227-236, November 2012.
11. A. Ovcharenko, O. Sahni, K. E. Jansen, **C. D. Carothers** and M. S. Shephard, "Neighborhood Communication Paradigm to Increase Scalability in Large-Scale Scientific Applications", In *Parallel Computing*, Volume 38, Issue 3, pages 140–156, March, 2012.
12. N. Liu, J. Fu, **C. D. Carothers**, O. Sahni, K. E. Jansen and M. S. Shephard, "Massively Parallel I/O for Partitioned Solver Systems", *Parallel Processing Letters*, Volume 20, Number 4, pages 377–395, 2010.
13. M. Zhou, O. Sahni, M. S. Shephard, **C. D. Carothers**, and K. E. Jansen, "Data Reordering Algorithms for Accelaration of Finite Element Computations", *Scientific Programming*, Volume 18, Number 2, pages 107–123, 2010.
14. M. J. Zaki, **C. D. Carothers**, and B. K. Szymanski, "VOGUE: A Novel Variable Order-Gap State Machine for Modeling Sequences", *ACM Transactions on Knowledge Discovery from Data (TKDD)*, Volume 4, Number 1, January 2010, article 5 (31 pages).
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and Distributed Computing (JPDC), #69, pages 652–665, 2009.

17. D. Bauer, and **C. D. Carothers**, "Seven-O'clock: A New Distributed GVT Algorithm Using Network Atomic Operations", In *Interational Journal of Simulation and Process Modeling* as part of special issue on Parallel and Distributed Simulation Volume 5, Number 2, pages 79–94, 2009.
18. C. Hsu, David Levermore, **C. D. Carothers**, and G. Babin, "Enterprises Collaboration: On-Demand Information Exchange Using Enterprise Databases, Wireless Sensor Networks, and RFID Systems", In *IEEE Transactions on Systems, Man, and Cybernetics*, Volume 37, Issue 4, pages 519–532, July, 2007.
19. C. Hsu, **C. D. Carothers**, and David Levermore, "A Market Mechanism for Participatory Global Query: A First Step of Enterprise Resources Self-Allocation", *Journal of Information Technology and Management*, Volume 7, Number 2, pages 71–89, April, 2006. `http://www.inderscience.com/browse/index.php?journalID=18`
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21. G. Yaun, **C. D Carothers**, S. Adali and D. Spooner, "Optimistic Parallel Simulation of a Large-Scale View Storage System", *Future Generation on Computer Systems (FCGS)*, Volume 19, Number 4, pages 479–492, November, 2003.
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23. **C. D. Carothers**, D Bauer and S. Pearce, "ROSS: A High-Performance, Low Memory, Modular Time Warp System," *Journal of Parallel and Distributed Computing (JPDC)*, #62, pages 1648–1669, 2002.
24. **C. D. Carothers** and R. M. Fujimoto, "Efficient Execution Time Warp Programs on Heterogeneous, NOW Platforms," *IEEE Transactions on Parallel and Distributed Systems (TPDS)*, Volume 11, Number 3, pages 299–317, March 2000.
25. **C. D. Carothers**, K. S. Perumalla, and R. M. Fujimoto, "Efficient Optimistic Parallel Simulations using Reverse Computation," (journal version). *ACM Transactions on Modeling and Computer Simulation (TOMACS)*, Volume 9, Number 3, pages 224–253, July 1999.
26. **C. D. Carothers**, B. Topol, R. M. Fujimoto, J. T. Stasko, and V. S. Sunderam, "Visualizing Parallel Simulations Executing in Network Computing Environments" (journal version), *Future Generations of Computer Systems (FGCS)*, volume 15, pages 513-529, 1999.

(b) **Short Articles**

1. T. Liu, L. Su, A. Ding, W. Ji, **C. D. Carothers**, X. G. Xu and F. Brown, "GPU/CUDA-Ready Parallel Monte Carlo Codes for Reactor Analysis and Other Applications", *Transactions of the American Nuclear Society*, volume 106, pages 378–379, 2012.

(c) **Professional Magazine**

1. **C. D. Carothers** and B. K. Szymanski, "Checkpointing Multithreaded Programs", *Dr. Dobbs Journal*, # 339, pages 46-51, August, 2002,

(d) **Journal Articles Under Review or In Preparation**

1. All articles currently accepted.

2. **In refereed CONFERENCES & WORKSHOPS (articles which are reviewed by peers in the field prior to publication).**

(a) **Major articles**

1. E. Cruz-Camacho, S. Qian, A. Shukla, N. McGlohon, S. Rakheja and **C. D. Carothers**, "Evaluating Performance of Spintronics-Based Spiking Neural Network Chips using Parallel Discrete Event Simulation", To Appear in *Proceedings of the 2020 ACM SIGSIM Conference on Principles of Advanced Discrete Simulation (ACM SIGSIM-PADS '22).* To Be Held On-line. June 8–10, 2022.
2. N. McGlohon, **C. D. Carothers**, "Toward Unbiased Deterministic Total Orderings of Parallel Simulations with Simultaneous Events", In *Proceedings of the 2021 Winter Simulation Conference*, Advanced Tutorial Track, December, 2021.
3. N. McGlohon, S. K. Hemmert, K. A. Brown, M. Levenhagen, S. Chunduri, R. B. Ross, **C. D. Carothers**. "Exploration of Congestion Control Techniques on Dragonfly-class HPC Networks Through Simulation". 12^{th} IEEE Workshop on Performance Modeling, Benchmarking and Simulation (PMBS) of High Performance Computer Systems as part of Supercomputing (SC'21), November 2021.
4. J. Ma, J. Goodhue, K. Nelson, A. Sherman, E. Brown, **C. D. Carothers**, G. Collier, A. Del Maestro, A. Elledge, W. Figurelle, J. Huffman, G. Khanna, N. McGlohon, S. Najafi, J. Nucciarone, A. Schwartz, B. Segee, S. Valcourt and R. Zottola. "Leveraging Northeast Cyberteam Successes to Build the CAREERS Cyberteam Program: Initial Lessons Learned", PEARC Workshop on Strategies for Enhancing HPC Education and Training (SEHET), July 2021.
5. K. Brown, E. Borch, N. McGlohon, S. Chunduri, R. Ross, K. Harms and **C. D. Carothers**, "A Tunable Implementation of Quality-of-Service Classes for HPC Networks", In *International Supercomputing Conference (ISC) High Performance 2021*, Held online due to COVID-19, June 24th – July 2nd, 2021.
6. P. Date, **C. D. Carothers**, J. Mitchell, J. Hendler and M. Magdon-Ismail "Training Deep Neural Networks with Constrained Learning Parameters",

In *IEEE International Conference on Rebooting Computing (ICRC) 2020*, Held online due to COVD-19, December 1–3, 2020.

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8. S. P. Kesavan, T. Fujiwara, J. Kelvin Li, C. Ross, M. Mubarak, **C. D. Carothers**, R. B. Ross and K.-L. Ma, "A Visual Analytics Framework for Reviewing Streaming Performance Data," 2020 IEEE Pacific Visualization Symposium (PacificVis), Tianjin, China, June 3–5, 2020, pp. 206-215, `doi:10.1109/PacificVis48177.2020.9280`.
9. M. McGlohon, N. Wolfe, M. Mubarak and **C. D. Carothers**, , "Fit Fly: A Case Study of Interconnect Innovation through Parallel Simulation", In *Proceedings of 2019 ACM-SIGSIM PADS Conference*, Chicago, IL, USA, June 3-5, 2019.
10. C. Ross, N. Wolfe, M. Plagge, **C. D. Carothers**, M. Mubarak and R. B Ross,"Using Scientific Visualization Techniques to Visualize Parallel Network Simulations" (short paper), In *Proceedings of 2019 ACM-SIGSIM PADS Conference*, Chicago, IL, USA, June 3-5, 2019.
11. M. Mubarak, N. McGlohon, M. Musleh, E. Borch, R. B. Ross, R. Huggahalli, S. Chunduri, S. Parker, **C. D. Carothers** and K. Kumaran. "Evaluating Quality of Service Traffic Classes on the Megafly Network", In *Proceedings of the 34th International Conference, ISC High Performance 2019*, Frankfurt, Germany, June, 2019.
12. C. Ross, J. K. Li, M. Mubarak, **C. D. Carothers**, K-L. Ma, R. B. Ross. "Leveraging Shared Memory in the ROSS Time Warp Simulator", In *Proceedings of the 2018 Winter Simulation Conference*, Gothenburg, Sweden, December 2018.
13. P. Date, **C. D. Carothers**, J. Hendler and M. Magdon-Ismail, "Efficient Classification of Supercomputer Failures using Neuromorphic Computing", In *Proceedings of the 2018 IEEE Symposium Series on Computational Intelligence (SSCI)*, November 18–21, Bengaluru, India, 2018.
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15. N Wolfe, M. Plagge, M. Mubarak, **C D. Carothers**, R. B. Ross. "Evaluating the Impact of Spiking Neural Network Traffic on Extreme-Scale Hybrid Systems", In *Proceedings of the 9th International Workshop on Performance Modeling, Benchmarking and Simulation (PMBS) of High*

Performance Computer Systems (PMBS 2018) as part of Supercomputing (SC'18). Dallas, Texas, November 2018.

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19. M. Mubarak, N. Jain, J. Domke, N. Wolfe, C. Ross, K. Li, A. Bhatele, **C. D. Carothers**, K-L Ma and R. B. Ross. "Toward Reliable Validation of HPC Interconnect Simulations", In *Proceedings of the 2017 Winter Simulation Conference*, Las Vegas, NV, December 2017.
20. E. Gonsiorowski, **C. D. Carothers**, J. LaPre, P. Heidelberger, C. Minkenberg, G. Rodriguez and B. Prisacari. "Using Quality of Service Lanes to Control the Impact of RAID Traffic within a Burst Buffer", In *Proceedings of the 2017 Winter Simulation Conference*, Las Vegas, NV, December 2017.
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33. C. Ross, M. Mubarak, J. Jenkins, P. Carns, **C. D. Carothers**, R. B Ross, W. Tang, W. Gerlach, and F. Meyer, "A Case Study in Using Discrete-Event Simulation to Improve the Scalability of MG-RAST", In *Proceedings of the 2016 ACM SIGSIM-PADS Conference*, May 15-18, 2016, Banif,

Alberta Canada.

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36. C. Iyer, H. Avron, G. Kollias, Y. Ineichen, **C. D. Carothers** and Petros Drineas, "A Scalable Randomized Least Squares Solver for Dense Overdetermined Systems", In *Proceedings of the 2015 Workshop on Latest Advances in Scalable Algorithms for Large-Scale Systems (ScalA) as part of Supercomputing (SC'15)*, Austin, TX., November 2015.
37. S. Snyder, P. Carns, R. Latham, M. Mubarak, R. Ross, **C. D. Carothers**, B. .B Huong, V. T. Luu and S. B. Prabhat "Techniques for Modeling Large-Scale HPC I/O Workloads", In *Proceedings of the 6th International Workshop on Performance Modeling, Benchmarking and Simulation of High Performance Computer Systems (PMBS 2015) as part of Supercomputing (SC'15).* Austin, TX, November 2015.
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54. E. Gonsiorowski, **C. D. Carothers**, and C. Tropper, "Modeling Large-Scale Circuits Using Massively Parallel Discrete-Event Simulation". In *Proceedings of the 20th IEEE International Symposium on Modeling, Analysis and Simulation of Computer and Telecommunication Systems (MASCOTS 2012)*, Arlington, Virginia, August 7–9th, 2012.
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56. T. B. Wickberg and **C. D. Carothers**, "The RAMdisk Storage Accelerator – A Method of Accelerating I/O Performance on HPC Systems Using RAMdisks". In *Proceedings of the 2012 International Workshop on Runtime and Operating Systems for Supercomputer (ROSS 2012)* as part of the International Conference on Supercomputers (ICS), Venice Italy, June 29th, 2012.
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ization of Full Data and In Situ Data Extracts from Unstructured Grid CFD at 160k Cores", Extended Abstract and Electronic Poster. In *Processings of the 2011 International Conference for High Performance Computing, Networking, Storage and Analysis (SC11).*

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61. A. Holder and **C. D. Carothers**, "Investigating the Memory Characteristics of a Massively Parallel Time Warp Kernel", In *Proceedings 2011 SCS/ACM/IEEE Winter Simulation Conference (WSC 2011)*, December 2011.
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63. N. Liu and **C. D. Carothers**, "Modeling Billion-Node Torus Networks Using Massively Parallel Discrete-Event Simulation", In *Proceedings of the ACM/IEEE/SCS 25th Workshop on Principles of Advanced and Distributed Simulation (PADS '11)*, pages 1–8, June 14–17, Nice, France 2011.
64. **C. D. Carothers** and K. S. Perumalla, "On Deciding Between Conservative and Optimsitic Approaches on Massively Parallel Platforms", *Invited & Reviewed*, In *Proceedings of the 2010 SCS/ACM/IEEE Winter Simulation Conference (WSC '10)*, December 2010.
65. J. Fu, N. Liu, O. Sahni, **C. D. Carothers**, K. E. Jansen and M. S. Shephard, "Scalable Parallel I/O Library Alternatives for a Massively Parallel Partitioned Solver Systems", *Proceedings of the 2010 Workshop on Large-Scale Parallel Processing (LSPP)* April 23rd, 2010 as part of the *2010 IEEE International Parallel & Distributed Processing Symposium.*
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68. D. W. Bauer and **C. D. Carothers** "Scalable RF Propagation Modeling on the IBM Blue Gene/L and Cray XT5 Supercomputers", *Invited*

& Reviewed Paper, In *Proceedings of the 2009 SCS/ACM/IEEE Winter Simulation Conference (WSC '09)*, December 2009.

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78. G. Yaun, D. Bauer, **C. D. Carothers**, "Sharing Event Data in Opti-

mistically Scheduled Multicast Applications", In *Proceedings of the 2005 Winter Simulation Conference (WSC '05)*, pages 2649–2656, December 2005.

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82. M. Peters and **C. D. Carothers**, "An Algorithm for Fully Reversible Optimistic Parallel Simulation", In *Proceedings of the 2003 SCS/ACM/IEEE Winter Simulation Conference (WSC '03)*, pages 864–871 December 2003.
83. K. Sequeira, M. J. Zaki, B. K. Szymanski, and **C. D. Carothers**, "Improving Spatial Locality using Data Mining", In *Proceedings of the* 9^{th} *Conference on Knowledge Discovery and Data Mining (KDD)*, August 2003.
84. C. Hsu and **C. D. Carothers**, "A Self-Scheduling Model Using Agent-Base, Peer-to-Peer Negotiation and Open Common Schema", In *Proceedings of the* 17^{th} *International Conference on Production Research (ICPR '03)*, Blacksburg VA, August 2003.
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86. B. Bouqata, **C D. Carothers**, B. K. Szymanski and M. J. Zaki, "Understanding Filesystem Performance for Data Mining Applications", In *Proceedings of the* 6^{th} *Workshop on High-Performance Data Mining*, May 2003.
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88. G. Yaun, **C. D Carothers**, S. Adali and D. Spooner, "Optimistic Parallel Simulation of a Large-Scale View Storage System", In *Proceedings of 2001 SCS/ACM/IEEE Winter Simulation Conference (WSC'01)*, pages 1363–1371, December 2001.
89. **C. D. Carothers**, D. Bauer and S. Pearce, "ROSS: A High-Performance,

Low Memory, Modular Time Warp System," In *Proceedings of the 14th ACM/IEEE/SCS Workshop of Parallel on Distributed Simulation (PADS 2000)*, pages 53–60, May 2000.

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92. **C. D. Carothers**, M. I. Hybinette, and R. M. Fujimoto, "Toward Parallelization of Large-Scale Ada Simulations Using Time Warp," *Proceedings of the 1998 Summer Computer Simulation Conference*, pages 600–606, July 1998.
93. **C. D. Carothers**, B. Topol, R. M. Fujimoto, J. T. Stasko, and V. S. Sunderam, "Visualizing Parallel Simulations in Network Computing Environments," (conference version), *Proceedings of the 1997 SCS/ACM/IEEE Winter Simulation Conference*, pages 110–117, December 1997.
94. **C. D. Carothers**, R. M. Fujimoto, R. M. Weatherly, and A. L. Wilson. "Design and Implementation of HLA Time Management in the RTI version F.0," *Proceedings of the 1997 SCS/ACM/IEEE Winter Simulation Conference*, pages 373–380, December 1997.
95. **C. D. Carothers**, and R. M. Fujimoto, "Background Execution of Time Warp Programs," *Proceedings of the 10th ACM/IEEE/SCS Workshop on Parallel and Distributed Simulation (PADS '96)*, pages 12–19, May 1996.
96. **C. D. Carothers**, R. M. Fujimoto and Y-B. Lin, "A Re-dial Model for Personal Communications Services Networks," *Proceedings of the IEEE 45th Vehicular Technology Conference" (VTC '95)*, pages 135–139, July 1995.
97. **C. D. Carothers**, R. M. Fujimoto and Y-B. Lin, "A Case Study in Simulating PCS Networks Using Time Warp," *Proceedings of the 9th ACM/IEEE/SCS Workshop on Parallel and Distributed Simulation (PADS '95)*, pages 87–94, June 1995.
98. **C. D. Carothers**, R. M. Fujimoto and P. England, "The Effect of Communication Overheads on Time Warp Performance: An Experimental Study," *Proceedings of the 8th Workshop on Parallel and Distributed Simulation (PADS '94)* , pages 118–125, July, 1994.

3. **Patents**

   (a) **Patents Awarded**

   1. Patent #10,417,558, September, 17, 2019, "Methods and Systems for Artifical Neural Network Optimistic Event Processing", Deep Insight Solutions, Inc. **C. D. Carothers**, D. W, Bauer, Jr. and Justin LaPre.

Note, work was done as Academic Adviser role to LUCD/Deep Insight Solutions, Inc..

2. Patent #8,606,846, December, 2013, "Accelerating Peer-to-Peer Content Distribution", NBC Universal, **C. D. Carothers**, J. Czechowski and W. D. Smith . *Note: work was done while on sabatical leave at GE Research.*

4. **In non-refereed articles**

(a) **Major articles**

1. D. Bauer, G. Yaun, **C. D. Carothers**, M. Yuksel, and S. Kalyanaraman, "ROSS.Net: An Optimistic Simulation Framework of Large-Scale Internet Models", *Invited Paper*, In *Proceedings of the 2003 SCS/ACM/IEEE Winter Simulation Conference (WSC '03)*, pages 703–711, December 2003.
2. **C. D. Carothers**, R. M. Fujimoto and Y-B. Lin, "Simulating Population Dependent PCS Network Models Using Time Warp," *Invited Paper*, *Proceedings of the 1995 SCS/ACM/IEEE Winter Simulation Conference (WSC '95)*, pages 555–562, December 1995.
3. **C. D. Carothers**, R. M Fujimoto, Y-B Lin and P. England, "Distributed Simulation of Large-Scale PCS Networks,", *Invited Paper*, *Proceedings of the Second International Workshop on Modeling, Analysis, and Simulation of Computer and Telecommunication Systems*, pages 2–6, February 1994.

(b) **Letters of correspondence, book reviews, etc.**

1. **C. D. Carothers**, B. K. Szymanski and M. Zaki, "Performance Mining of Large-Scale Data-Intensive Applications", Extended Abstract, In *Proceedings of the International Parallel and Distribution Processing Symposium (IPDPS 2002)*, April 2002.
2. **C. D. Carothers**, M. J. Zaki, and B. K. Szymanski, "ISSAC: An Intelligent System for Exploiting Speculative Execution and Active Code in Large-Scale Distributed Simulations," (extended abstract), In *Proceedings of the 1999 Dagsthul Workshop on Agent-Based Simulation*, Dagsthul, Germany, May, 1999.
3. **C. D. Carothers**, B. Topol, R. M. Fujimoto, J. T. Stasko, and V. Sunderam, "Middleware-Specific Visualization Support for Parallel Simulations in Cluster Environments," (extended abstract). *Proceedings of the 1997 Cluster Computing Conference (CCC'97)*, May 1997.

(c) **Technical Reports**

1. **C. D. Carothers**, D. Bauer, S. Pearce. "ROSS: Rensselaer's Optimistic Simulation System, User's Guide", Rensselaer Polytechnic Institute Technical Report, TR-02-12, `http://www.cs.rpi.edu/tr/02-12.pdf`, 2002.
2. S. Adali, D. Spooner, and **C. D. Carothers**. "CAVES: A Configurable Application View Storage System," Rensselaer Polytechnic Institute Technical Report, TR-02-2000.

VI. **Research Grants and Contracts**

(Give title of project, other senior investigators, starting and completion dates, amount of funding, sponsoring agency.)

A. **Proposals Approved and Funded**

1. "Advanced AI Testbed Support", IBM Corporation, Part of IBM-NYS AI Hardware Center, C. D. Carothers (PI), *Award Period: 09/01/2021 – 12/31/2024*, *Award Amount: $400,000.*
2. "Magnetic Nanoelectronics for Brain-Inspired Computing (MN-BRIC): From Circuit Models to Full System Architecture Simulations", AFRL Discovery Research Program, C. D. Carothers (PI), *Award Period: 04/29/2021 – 12/31/2022*, *Award Amount: $100,000. Note, this is a a collaborative project with S. Rakheja at UIUC under a separate AFRL Discovery Award.*
3. "Software Stack Definition and Algorithmic Exploration for High Performance Artifical Intelligency Applications", IBM AIHWC Research Program, C. D. Carothers (RPI PI), Kailash Gopalakrishnan (IBM PI), *Award Period: 09/01/2020 – 12/31/2021*, *Award Amount: $209,374.*
4. "CC* Team: CAREERS: Cyberteam to Advance Research and Education in Eastern Regional Schools", A. Sherman, Yale (PI), C. D. Carothers, RPI (Co-PI), G. Collier, Rutgers (Co-PI), W. Figurelle, Penn State Univ. (Co-PI) and K. Kaugars, Univ. of Rhode Island (Co-PI), NSF Campus Cyberinstructure Program, *Award Period: 07/01/2020 – 06/30/2023*, *Award Amount: $1,399,829.*
5. "Neuromorphic Architecture and Function Research Project", C. D. Carothers (PI), Boeing Corporation, *Award Period: 11/01/2019 – 12/31/2021*, *Award Amount: $150,000.*
6. "NYS-IBM AI Test Bed", C. D. Carothers (PI), Research Foundation of SUNY, Part of IBM AI Hardware Center, *Award Period: 09/15/2019 – 09/14/2024*, *Award Amount: $30,000,000. Note, this subaward is part of the larger $300,000,000 IBM-NYS AI Hardware center funded by New York State.*
7. "MRI: Acquisition of a Next Generation of Data Centric Supercomputer", C. D. Carothers (PI), K. Bennett (Co-PI), M. S. Shephard (Co-PI), G. Slota, M. Zaki (Co-PI), NSF MRI Program, *Award Period: 09/01/2018 – 08/31/2021*, *Award Amount: $999,000.*
8. "EAGER: Advanced Cyberinfrastructure Training for Modeling Physical Systems Research", J. Giedt (PI), V. Meunier (Co-PI) and C. D. Carothers (Co-PI), NSF ACI CyberTraining Program, *Award Period: 09/01/2018 – 08/30/2021*, *Award Amount: $300,000.*
9. "Validated Thermal-Material Simulation to Predict Microstructure Evolution in Selective Laser Melting Additive Manufacturing of Nickel Alloys", D. Lewis (RPI, PI), C. D. Carothers (RPI, Co-PI), A. M. Maniatty (RPI, Co-PI), J. Samuel (RPI, Co-PI) and S. Rock (RPI, Co-PI). NASA, *Award Period: 01/15/2018 – 01/14/2021*, *Award Amount: $500,000.*

10. "System-Level Interconnect Simulation for the Exascale Computing Project" R. B Ross (ANL, PI), M. Mubarak (ANL, Co-PI), C. D. Carothers (RPI, PI). *DOE Exascale Computing Project*, This is part of the larger ANL effort in Design Space Evaluation Capabilities for the Exascale Computing Project, *Award Period: 10/01/2017 – 09/30/2021*, *Award Amount: $474,500 (RPI's share).*
11. "Supporting Co-Design of Extreme-Scale Systems with In Situ Visual Analysis of Event-Driven Simulations", K-L Ma (PI, UC Davis), C. D. Carothers (Co-PI, RPI) and R. Ross (Co-PI, DOE/ANL), DOE/Office of Science Program Office: Advanced Scientific Computing Research, *Award Period: 09/01/2015 – 08/31/2019*, *Award Amount: $1,532,589 with RPI share $450,000.*
12. "Massively Parallel Modeling and Simulation of Next Generation Hybrid Neuromorphic Supercomputer Systems", C. D. Carothers (PI), J. A. Hendler (Co-PI), Air Force Research Lab, BAA RIKA-14-05, *Award Period: 03/05/2015 – 12/31/2018*, *Award Amount: $1,309,000.*
13. "Predictive Modeling and Diagnostic Monitoring of Extreme Science Workflows", E. Deelman (PI, USC/ISI), B. Tierney (Co-PI, DOE/LBNL), J. Vetter (Co-PI, DOE/ORNL), A. Mandal (Co-PI, RENCI/UNC), C. D. Carothers (Co-PI, RPI), DOE/Office of Science Program Office: Office of Advanced Scientific Computing Research, *Award Period: 09/01/2014 – 08/31/2018*, *Award Amount: $4,000,000 with RPI share $309,090*
14. "Planetary Scale Agent Simulation", P. D. Barnes (PI, DOE/LLNL), A. Bhatele (Co-PI, DOE/LLNL), C. D. Carothers (Co-PI, RPI), David Jefferson (Co-PI, DOE/LLNL), L. V. Kale (Co-PI, UIUC), S. Niklaev (Co-PI, DOE/LLNL), D. Quinlan (Co-PI, DOE/LLNL), M. Schordan (Co-PI, DOE/LLNL), M. Schulz (Co-PI, DOE/LLNL), T. K. Vassilevska (Co-PI, DOE/LLNL), Lawrence Livermore National Laboratory – Laboratory Directed Research and Development (LDRD) Program. *Award Period: 01/01/2014 – 12/30/2016*, *Award Amount: $2,800,000 with RPI share $230,000.*
15. "Data Centric Deep Computing", J. Kahle (PI/IBM), P. Coteus (PI/IBM), P. Heidelberger (Co-PI/IBM), M. Taubenblatt (Co-PI/IBM) and C. D. Carothers (PI/RPI), DOE/Office of Science Program Office: Design Forward Program, *Award Period: Oct, 2013 – September, 2015*, *Award Amount: $4,158,000 with $338,112 as RPI's share.*
16. "Co-Design of Exascale Storage and Science Data Facilities (CODES)", R. Ross (PI/ANL), C. D. Carothers (PI/RPI). DOE/Office of Science Program Office: Advanced Scientific Computing Research (ASCR), *Award Period: October, 2013 – September, 2016*, *Award Value: $1,785,000 with $562,000 as RPI's share.*
17. "III: Medium: Mining Petabytes of Data Using Cloud Computing and a Massively Parallel Cyberinstrument", P. Drineas(PI), C. D. Carothers (Co-PI), Angel Garcia (Co-PI), B. Yener (Co-PI), M. Zaki (Co-PI), NSF IIS Information Integration and Informatics Program, *Award Period: September 2013 – August 2016*, *Award Amount: $1,000,000.*

18. "GPU-Based Monte Carlo Software for Computing CT Imaging Doses", G. Xu (PI), C. D. Carothers (Co-PI), W. Ji (Co-PI), M. S. Shephard (Co-PI). NIH National Institute of Biomedical Imaging and Bioengineering, *Award Period: August 2012 – May, 2016*, *Award Amount: $2,600,000*.
19. "SI2:SSE-Collaborative Research: Advanced Software Infrastructure for Biomechanical Inverse Problems", A Oberai (PI) and C. D. Carothers (Co-PI) and P. E. Barbone (PI for Boston University). NSF Software Institutes Program, *Award Period: May, 2012 – April, 2015*, *Award Amount: $530,000 of which $290,301 is RPI's share*.
20. "Revolutionary Storage Simulation Infrastructure", C. D. Carothers (Sole PI/PD). Department of Energy, Parallel File Systems group within the MCS Dvision of Argonne National Labs. *Award Period: January, 2012 – May, 2012*, *Award Value: $33,478*.
21. "Extreme-Scalable Hybrid Programming for Computation and Upgrading I/O in NekCEM Code", C. D. Carothers (Sole PI/PD). Department of Energy, NekCEM group within the MCS Divsion of Argonne National Labs. *Award Period: January, 2012 – May, 2012*, *Award Amount: $29,500*.
22. "MRI: Acquisition of a Balanced Environment for Simulation", C. D. Carothers (PI), P. Fox, (Co-PI), J. Myers (Co-PI), M. Shephard (Co-PI), L. Zhang (Co-PI). NSF-MRI Program, *Award Period: September, 2011 – August, 2014*, *Award Amount: $2,657,633*
23. "Massively Parallel VHDL Modeling and Simulation Using the ROSS Discrete-Event Simulation Framework", C. D. Carothers (Sole PI/PD), Air Force Research Laboratory, *Award Period: April, 2011 – December, 2012*, *Award Amount: $154,775*.
24. "Petascale Adaptive CFD", K. Jansen (PI), C. D. Carothers (Co-PI), O. Sahni (Co-PI), M. Shephard (Co-PI). Department of Energy Early Science Program for computer time on the 800,000 processor "Mira" IBM Blue Gene/Q. *Award Period: To be determined when machine is available in Q3/2011*, *Award Amount: 150,000,000 CPU-hours*.
25. "CoDES: Enabling Co-Design of Multi-Layer Exascale Storage Architectures", C. D. Carothers (RPI/PI), Rob Ross (ANL/PI) and Sam Lang (ANL/Co-PI), Department of Energy, Advanced Architectures and Critical Technologies for Exascale Computing Program, *Award Period: September 2010 – August 2013*, *Award Amount: $2.3M total, $432K RPI, $1.9M ANL/LLNL*.
26. "Petascale Adaptive CFD for Anisotropic Flows", K. Jansen (PI), C. D. Carothers (Co-PI), O. Sahni (Co-PI), M. Shephard (Co-PI). 2010 Innovative and Novel Computational Impact on Theory and Experiment (INCITE) Award, Department of Energy for computer time on the 163,840 processor IBM Blue Gene/P. *Award Period: January 2010 – January, 2011*, *Award Amount: 20,000,000 CPU-hours*.
27. "CRI: CI-P: SPADE: A High-Performance Computing Platform for Support of Robotics Research and Education", J. Trinkle (PI), and Carothers

(Co-PI), NSF Computing Research Infrastructure Program, *Contract Period: Oct, 2009 – Sept 2010*, *Award Amount: $ 40,000.*

28. "Large-Scale, High-Fidelity 802.11 Network Models Using the ROSS/ROSS.Net Parallel Simulation Framework", C. D. Carothers (Sole PI/PD). Army Research Lab (ARL), *Contract Period: September 2009 – December 2012*, *Award Amount: $410,361.*
29. "Advancing the Frontiers of Visualization at Rensselaer", M. S. Shephard (PD), K. E. Jansen (Co-PD), B. M Cutler(Co-PI), C. D. Carothers (Co-PI), B. Roysam (Co-PI), M. Embrechts (Co-PI), A. Todorski (Co-PI). IBM SUR Equipment Award. *Contract Period: May 2009 – April 2010 Award Amount: $250,000.*
30. "Petascale Adaptive CFD for Anisotropic Flows", K. Jansen (PI), C. D. Carothers (Co-PI), O. Sahni (Co-PI), M. Shephard (Co-PI). 2009 Innovative and Novel Computational Impact on Theory and Experiment (INCITE) Award, Department of Energy for computer time on the 163,840 processor IBM Blue Gene/P. *Award Period: January 2009 – January, 2010*, *Award Amount: 5,000,000 CPU-hours.*
31. "Petascale Adaptive Computational Fluid Dynamics", K. Jansen (PI) , C.D. Carothers (Co-PI), A. Oberai (Co-PI), M. Shephard (Co-PI), NSF/PetaAPPS Program. *Contract Period: September 2008 – August 2011. Award Amount: $1,000,000.*
32. "IBM/CCNI Research Projects: Multithreaded / Parallel Electronic Design Automation (EDA) Applications", C. D. Carothers (PI), International Business Machine (IBM), *Contract Period: October 2007 – August 2014. Award Amount to Date: $211,000 has been committed. Note: this project is part of an umbrella of projects funded by IBM with a total potential value of $2,500,000. Prof. Mark Shephard is the project director for the whole profolio of projects.*
33. "Digital Download Acceleration", C. D. Carothers. NBC/Universal Studios sponsered leave research at General Electric Global Research Center, *Contract Period: January 2007 – August 2007. Award Amount: $100,000.* Used to support Sabbatical leave.
34. "Digital Download Acceleration", C. D. Carothers. NBC/Universal Studios sponsered sabbatical research at General Electric Global Research Center, *Contract Period: September 2005 – August 2006. Award Amount: $100,000.* Used to support Sabbatical leave.
35. "NeTS-NR ROSS.Net: A Platform for Integrated Large-Scale Network Design of Experiments and Simulation", S. Kalyanaraman (Co-PI), and C. D. Carothers (Co-PI), NSF/NeTS-NR Program, CCR-0435259, *Award Period: September 2005 – December 2009*, *Award Amount: $500,000.*
36. "MRI: Acquisition of Infrastructure for Research in Grid Computing and Multiscale Systems Computation", M. Shephard (PI), C. D. Carothers (Co-PI), S. Garde (Co-PI), J. Trinkle (Co-PI), and C. Varela (Co-PI), NSF/MRI-0420703, *Award Period: September 2004 – May, 2007*, *Award Amount:*

$500,000. RPI cost-sharing of $214,000 for a total equipment budget of $714,000.

37. "Improving Spatial Locality Using Data Mining", M. Zaki (PI), C. D. Carothers (Co-PI) and B. K. Szymanski (Co-PI), NSF-NGS, *Award Period: May, 2004 – December, 2005*, *Award Amount: $14,500*.
38. "Tools and Techniques for Internet Protocol Management", AT&T Research Lab, S. Kalyanaraman (PI), B. Sikdar (Co-PI) and C. D. Carothers (Co-PI), *Award Period: January 2002 – May 2007*, *Award Amount: $250,000 total*.
39. "High Performance Robust Network Management: Theoretical Foundation and Practical Design Tools", M. Arcak (Co-PI), B. Azimi-Sadjadi (Co-PI), C. D. Carothers (Co-PI), S. Kalyanaraman (Co-PI), B. Sikdar (Co-PI), J. Wen (PI), Rensselaer Exploratory Seed Program, *Award Period, January 2002 – May, 2003*, *Award Amount: $50,000*.
40. "Processing and Display of Volume Images and High Resolution Image Sequences", R. J. Radke (Co-PI), W. A. Perlman (Co-PI), J. W. Woods, (Co-PI), C. D. Carothers (Co-I), Q. Ji (Co-I), K. Rajan (Co-I), X. C. Zhang (Co-I), NSF-EIA, Experimental and Investigative Activities Program, EIA-0224433, *Award Period: August, 2002 – July, 2004*, *Award Amount: $109,067*.
41. "CAREER: Scalable, High-Performance Network Simulations Using Reverse Computation", C. D. Carothers (sole PI), NSF-CCR, Operating Systems and Compiler Program, CCR-0133488, *Award Period: June, 2002 – June, 2007*, *Award Amount: $375,000*. **note: proposal ONE of THREE out of 31 to be given the Highly-Competitive ranking**.
42. "Performance Mining of Large-Scale Data-Intensive Distributed Object Applications", M. J. Zaki (PI), C. D. Carothers (Co-PI), B. K. Szymanski (Co-PI), NSF-NGS Next Generation Software Program, EIA-0110708, *Award Period: September, 2001 – August, 2004*, *Award Amount: $409,000*.
43. "Experimental Partnership – Real Time Computer Vision Spatial Mapping and Referencing for Minimally Invasive Surgery", B. Roysam (Co-PI), C. V. Stewart (Co-PI) and C. D. Carothers (Co-PI). NSF-EIA Experimental Systems Program. EIA-0000417, *Award Period: October, 2001 – October, 2003*, *Award Amount: $15,000*.
44. "Real-Time Computer Vision Spatial Mapping and Referencing for Minimally Invasive Surgery", B. Roysam (PI), C. V. Stewart (Co-PI) and C. D. Carothers (Co-PI). NSF-EIA Experimental Systems Program. EIA-0000417 *Award Period: October, 2000 – October, 2004*, *Award Amount: $1,300,000*.
45. "Scalable Online Network Modeling and Simulation", B. K. Szymanski (PI), C. D. Carothers (Co-PI), S. Kalyanaraman (Co-PI) , and K. S. Vastola (Co-PI). DARPA Network Modeling and Simulation Program, F30602-00-2-0537,*Award Period: June 2000 – September, 2003*, *Award Amount: $950,000*.
46. "CAVES: Creating Test Applications", S. Adali (PI), C. D. Carothers (Co-PI), and D. Spooner (Co-PI), NSF-IIS Information and Data Management Program, IIS-9876932, *Award Period: September, 2000 – August, 2004*,

Award Amount: $6,000.

47. "CAVES: A Configurable Application View Storage", S. Adali (PI), C. D. Carothers (Co-PI), and D. Spooner (Co-PI). NSF-IIS Information and Data Management Program, IIS-9876932, *Award Period: September, 1999 – August, 2004*, *Award Amount : $266,000.*

B. **Briefly describe your current research interests**

Massively parallel and distributed systems, massively parallel simulation of discrete systems, data modeling (i.e., data mining and HMMs) and real-time systems. Most recent focus has been the modeling of large-scale, HPC storage systems and networks (HPC, peer-2-peer, WAN and wireless).

VII. Editorship of Journals and Reviews of Manuscripts, Books and Research Proposals

(Give organization of journals, significant items reviewed, date.)

(a) **Editorships**

2021	**Guest Editor**, ACM Transactions on Modeling and Computer Simulation, "Best of ACM-SIGSIM PADS 2020" Special Issue, To Appear
2016–2020	**Associate Editor**, IEEE Transactions on Parallel and Distributed Systems.
2016	**Guest Editor**, ACM Transactions on Modeling and Computer Simulation, "Best of ACM-SIGSIM PADS 2016" Special Issue, #4, October 2018.
2006–2011	**Associate Editor**, SIMULATION: Transactions of the Society for Modeling and Simulation International.
2006-2010	**Associate Editor**, ACM Transactions on Modeling and Computer Simulation.
2006	**Guest Editor**, "Best of PADS" Special Issue for SIMULATION: Transactions of the Society for Modeling and Simulation International, Volume 82, Number 1, January 2006.
1999	**Guest Editor** of First SCS SIMULATION/Transactions Joint Special-Issue on Parallel and Distributed Simulation. SIMULATION, Transactions of the Society for Modeling and Simulation International, Volume 16, Number 1, March 1999.

(b) **Refereeing**

1. **Program Co-Chair**, 2022 ACM SIGSIM Conference on Principles of Advanced Simulation (PADS), single-term only.
2. **Program Co-Chair**, 2020 ACM SIGSIM Conference on Principles of Advanced Simulation (PADS), single-term only.
3. **Program Committee, Machine Learning & HPC Track**, SC'19.
4. **External Review Committee**, 2014 ACM International Conference on Supercomputing.

5. **Program Committee**, 2013, 2017 IEEE International Parallel & Distributed Processing Symposium.
6. **Program Co-Chair**, 2016 ACM SIGSIM Conference on Principles of Advanced Simulation (PADS), single-term only.
7. **Program Committee**, 2011, 2012 Special Session on Improving MPI User and Developer Interaction (co-located as part of EuroMPI).
8. **Program Committee**, 2011 – 2013 International SIMUTools Conference.
9. **Program Committee**, 2012, 2006 IEEE International Symposium on Distributed Simulation and Real Time Applications (DS-RT).
10. **Program Co-Chair**, 2005 Workshop on Parallel and Distributed Simulation (PADS), single-term only.
11. **Program Committee**, The Twelfth International Conference on Parallel and Distributed Systems (ICPADS). 2006
12. **Program Committee**, Workshop on Principles of Advanced Discrete Simulation (ACM-SIGSIM PADS). 2000–Present.
13. **Program Committee**, *International Workshop on Modeling, Analysis, and Simulation of Computer and Telecommunication Systems (MASCOTS).* 2001–2004, 2012, 2013.
14. **Referee/Reviewer:**
    ACM Computing Reviews,
    IEEE INFOCOMM – The Conference on Computer Communication,
    ACM Transactions on Modeling and Computer Simulation (TOMACS),
    IEEE Transactions on Parallel and Distributed Systems (TPDS),
    Journal on Parallel and Distributed Computing (JPDC)
    Parallel Computing Journal (Elsevier)
    IEEE International Parallel & Distributed Processing Symposium (IPDPS)
    ACM Conference on Parallel and Advanced Simulation (ACM SIGSIM PADS),
    International Workshop on Modeling, Analysis, and
    Simulation of Computer and Telecommunication Systems (MASCOTS),
    Winter Simulation Conference (WSC),
    Mobile Computing Conference (MCC),
    The Hawaii International Conference on System Sciences (HICSS)
15. **Panel Reviewer**, NSF MRI Program, 2020.
16. **Panel Reviewer**, NSF CSR Program, 2014.
17. **Panel Reviewer**, NSF CAREER Program, 2003.
18. **Panel Reviewer**, NSF-ITR Program, 2000 and 2002.

VIII. Service

A. Service to University

1. *National, University, School, and Department committees and dates for each.*
   (a) **National**

- Council on Competitiveness High Performance Computing Advisory Committtee, 2014-2018.

(b) **University**

- Member, DAIC Steering Committee, 2021-Present.
- Member, Institute Faculty P&T Committee, 2018-2019, 2020-2021 and 2021-2022.
- Member, EMPAC Steering Committee, 2013-2014.
- Member, IDEA Steering Committee, 2013-2014.
- Member, MDIS Steering Committee, 2013.
- Member, VPR Faculty Subcommittee for Intellectual Property, 2014.
- Co-Chair/Editor, Computer Science/IT Working Group Committee, 2010.
- Member, Faculty Governance Review Committee, 2008.
- Member, Ad Hoc on Campus Research Computing, July, 2001 – Present.

(c) **School**

- Ad Hoc Committee on Infrastructure, November, 2000 – December, 2000.
- Chair, Facilities and Infrastructure Committee, September, 2001 – Present

(d) **Department**

- Member, Faculty Hiring Committee, 2021-2022.
- Chair, Lab Committee, 2004 – Present.
- Member, Planning Committee, 2004 – Present.
- Member, Space Utilization Committee, 2003 – Present.
- Chair, Lab Committee, 2000 – 2003.
- Member, Lab Committee, 2003 – present.
- Member, Graduate Program Committee, 1999–2000.

B. **Professional Societies**

(Give memberships, positions held, dates.)

ACM Association for Computing Machinery, Member
IEEE Computer Society, Senior Member

C. **Community and Public Service**

1. July, 2011– June, 2012: Vice President of Finance, Bet Shraga Hebrew Academy of the Capital Region.
2. 2010–2012: Board of Trustees, Bet Shraga Hebrew Academy of the Capital Region

IX. Professional and Public Lectures

(a) Conference & Workshop Presentations

1. "Durango: Scalable Synthetic Workload Generation for Extreme-Scale Application Performance Modeling and Simulation", In *Proceedings of the 2017 ACM SIGSIM-PADS Conference*, pages 97–108, Singapore, May 24–26, 2017. **C. D. Carothers (presenter)**.
2. "Using Massively Parallel Simulation for MPI Collective Communication Modeling in Extreme-Scale Networks", In *Proceedings of the 2014 Winter Simulation Conference*, Savannah GA, December 7–10, 2014. **C. D. Carothers (presenter)**.
3. "Using Charm++ to Improve Extreme Parallel Discrete-Event Simulation (XPDES) Performance and Capability", In *12 Annual Charm++ Workshop*, UIUC, Champaign-Urbana, Illinois, April 29–30, 2014. E. Gonsiorowski and **C. D. Carothers** presenters).
4. "Performance of Time Warp on 1,966,080 Cores", 2014 SIAM Parallel Processing Symposium, Kinetic Monte-Carlo and Parallel Discrete-Event Simulation Minisymposium, Feb, 2014.
5. "Warp Speed: Executing Time Warp on 1,966,080 Cores", 2013 ACM SIGSIM Conference on Principles of Advanced Discrete Simulation (PADS), Montreal, Canada, May 2013. **C. D. Carothers (presenter)**.
6. "On Deciding Between Conservative and Optimsitic Approaches on Massively Parallel Platforms", *Invited & Reviewed*, In *Proceedings of the 2010 SCS/ACM/IEEE Winter Simulation Conference (WSC '10)*, December 2010. **C. D. Carothers (presenter)** and K. S. Perumalla.
7. "Scalable Parallel I/O Library Alternatives for a Massively Parallel Partitioned Solver Systems", Presented at the *2010 Workshop on Large-Scale Parallel Processing (LSPP)* April 23rd, 2010 as part of the *2010 IEEE International Parallel & Distributed Processing Symposium.* **C. D. Carothers (presenter)**.
8. ""Scalable Time Warp on Blue Gene Supercomputers", presented at the *23rd Workshop on Principles of Advanced and Distributed Simulation (PADS '09)*, June 22-26, 2009. **C. D. Carothers and D. Bauer (presenters)**, **BEST PAPER AWARD**.
9. "ROSS: Parallel Discrete-Event Simulations on Near Petascale Supercomputers", 2009 Charm++ Workshop, University of Illnois, Urbanna-Champagne (UIUC), April 16th, 2009. **C. D. Carothers (presenter)**.
10. "Analysis of Cluster Failures on Blue Gene Supercomputing Systems", Presented at the 2009 NSF Blue Waters/TeraGrid Workshop on Fault Tolerance, March 19-20. **C. D. Carothers (RPI)** and T. J. Hacker (Purdue), presenters.
11. "Petascale Adaptive Computional Fluid Dymamics", presented at the *2008 NSF Blue Waters Workshop*, October 2008, K. Jansen and **C. D Carothers**, presenters.

12. "A Case Study in Modeling Large-Scale Peer-to-Peer File-Sharing Networks Using Discrete-Event Simulation",*Proceedings of the 2nd European Modeling AND Simulation Symposium*, Barcelona, Spain, October 2006. **C. D. Carothers (presenter)**,
13. "Sharing Event Data in Optimistically Scheduled Multicast Applications", In *Proceedings of the 2005 Winter Simulation Conference (WSC '05)*, December 2005, Poster Session, Orlando, Florida, December 5, 2005, G. Yaun (Presenter), D. Bauer (Presenter), and **C. D. Carothers (presenter)**.
14. "Seven-O'Clock: A New Distributed GVT Algorithm Using Network Atomic Operations", In *Proceedings of the 19th Workshop on Principles of Advanced and Distributed Simulation (PADS '05)*, June 2005, Monterey, California, **C. D. Carothers (Presenter)**.
15. "*XSim*: Real-Time Analytic Parallel Simulations," presented at the *16th Workshop on Parallel and Distributed Simulation (PADS 2002)*, May 12th, 2002. **C. D. Carothers (presenter)**.
16. "ROSS: A High-Performance, Low Memory, Modular Time Warp System," presented at the *14th Workshop of Parallel on Distributed Simulation (PADS 2000)*, Bolonga Italy, May 29th, 2000. **C. D. Carothers (presenter)**.
17. "The Effect of State-Saving in Optimistic Simulation on A Cache-Coherent Non-Uniform Memory Access Architecture," presented at the *1999 Winter Simulation Conference*, December 13th, 1999. **C. D. Carothers (presenter)**.
18. "Toward Parallelization of Large-Scale Ada Simulations Using Time Warp," presented at the *1998 Summer Computer Simulation Conference*, July 26th, 1998. **C. D. Carothers (presenter)**, M. I. Hybinette, and R. M. Fujimoto.
19. "Visualizing Parallel Simulations in Network Computing Environments," presented at the *1997 Winter Simulation Conference*, December 8th, 1997. **C. D. Carothers (co-presenter)**, B. Topol (co-presenter).
20. "Design and Implementation of HLA Time Management in the RTI version F.0," presented at the *1997 Winter Simulation Conference*, December 8th, 1997. **C. D. Carothers (presenter)**.
21. "Background Execution of Time Warp Programs," presented at the *10th Workshop on Parallel and Distributed Simulation (PADS '96)*, May 23rd, 1996. **C. D. Carothers (presenter)**.
22. "A Re-dial Model for Personal Communications Services Networks," presented at the *45th IEEE Vehicular Technology Conference" (VTC '95)*, July 27th, 1995. **C. D. Carothers (presenter)**.
23. "A Case Study in Simulating PCS Networks Using Time Warp," presented at the *9th Workshop on Parallel and Distributed Simulation (PADS '95)*, June 15th, 1995. **C. D. Carothers (presenter)**.

(b) **Invited Lectures and Presentations**

1. "AiMOS - The AI Hardware Center Testbed", **C. D. Carothers (presenter)**, 2021, IBM AI Hardware Center Annual Meeting, Poster Session, Held

Online, October, 7th, 2021.

2. "Riding the Composable Systems Wave to Improve DNN Distributed Training Performance", **C. D. Carothers (keynote talk)**, 2021 ScaDL Workshop, part of the IEEE International Parallel and Distributed Processing Symposium (IPDPS), Held Online. May 21st, 2021.
3. "Using the AiMOS Supercomputer to Attack COVID-19", RPI Research Showcase 2020, November 2020, Held Online. **C. D. Carothers (co-presenter)** and H. Weinstein (Cornell Medical College, co-presenter). URL: `https://youtu.be/MFZzLy6H0Dw`, Talk #3.
4. "ROSS: A Massively Parallel Discrete-Event Simulator for Modeling Extreme-Scale Computer Systems", Alphabet-Wide Talk Series, Dr. Greg Bronevetsky (talk host), September 30th, 2020, Held Online, **C. D. Carothers (presenter)**.
5. "Parallel Discrete-Event Simulation", CyberTraining Summer School 2020, part of NSF suported EAGER cyberinfrastructure training grant, June 10, 2020, Held On-line, **C. D. Carothers (presenter)**.
6. "Why Not Change the World? The RPI Podcast: Supercomputers", Part of the RPI Podcast Series, **C. D. Carothers** co-presented with J. Kolb, RPI CIO. URL: `https://www.youtube.com/watch?v=Uocsv04_FOw`.
7. "Fit Fly: A Case Study on Interconnect Innovation Through Parallel Simulation", 2019 DOE Modsim Workshop, August 14–16, 2019, Seattle Washington, **C. D. Carothers (presenter)**.
8. "CODES: Co-Design of Multi-Layer Exascale Storage Architectures", 2017 DOE ASCR Computer Science Research PI Meeting, March 14–16, 2017, Washington D.C., **C. D. Carothers (presenter)**.
9. "Design of Shared Memory Pools for Improved Communications in ROSS", Summer of CODES Workshop, July 12-13th, 2016, Argonne National Laboratory, Chicago, IL, **C. D. Carothers (presenter)**.
10. "CODES: Using Parallel Discrete-Event Simulation to Model Extreme-Scale and Distributed Data-Intensive Systems", Speaker, *XPDES Meeting #5*, DOE LLNL, December 4th, 2015, **C. D. Carothers (presenter)**
11. "CODES: Using Parallel Discrete-Event Simulation to Model Extreme-Scale and Distributed Data-Intensive Systems", Keynote Speaker, *11th International Conference on Parallel Processing and Applied Mathematics*, Krakow, Poland, September 8th, 2015, **C. D. Carothers (presenter)**
12. "Enabling Scalable Parallel Processing of Venus/OMNeT++ Network Models on the IBM Blue Gene/Q Supercomputer", Keynote Speaker, *OMNeT++ Community Summit 2015*, IBM Research, Zurich, Switzerland, September 3rd, 2015, **C. D. Carothers (presenter)**
13. "Going to Camp? You'll Need A Supercomputer to Get You There.. But Please Leave the Internet at Home", ECSE Distinguished Mercer Lecture at Rensseleaer, Troy NY, May 6th 2015. **C. D. Carothers (presenter)**.

14. "DOE Workflows Workshop", Served on Organization Committee, DOE Office of Science, Rockville, MD, April 20-21, 2015.
15. "Co-Design of Exascale Storage and Science Data Facilities (CODES)", PI workshop for DOE ASCR Computer Science award recipients in the area of Scientific Data Management, Analysis and Visualization, DOE Office of Science, Walnut Creek CA, January 13–15, 2015. **C. D. Carothers (presenter)**.
16. "Pathways to IDEA", 2013 Rensselaer Faculty Award Celebration Event Keynote Speaker, December 12, 2013. **C. D. Carothers (presenter)**.
17. "DOE ASCR Workshop on Performance Modeling and Simulation", Workshop Organizers: Adolfy Hoisie (DOE/PNNL) Chair, Laura Carrington, Darren Kerbyson, Bob Lucas, David Nicol, Boyana Norris, Arun Rodrigues, John Shalf, Doug Thain, Jeffrey Vetter, Sudhakar Yalamanchili. Seattle, Washington, September 18th – 19th, 2013. **C. D. Carothers - special invite participant**.
18. "Modeling Big Data/HPC Storage Using Massively Parallel Simulation", NIST Joint Cloud and Big Data Forum & Workshop, National Institute of Standards and Technology, Gaithersburg, MD., January 15-17, 2013. **C. D. Carothers (presenter)**.
19. "DOE ASCR Workshop on Performance Modeling and Simulation", Workshop Organizers: Adolfy Hoisie (DOE/PNNL), Darren Kerbyson (DOE/PNNL), Bob Lucas (DOE/PNNL), Arun Rodrigues (DOE/LLNL), John Shalf (DOE/LLNL), Allan Snavely (DOE/LLNL), Jeff Vetter (DOE/ORL). Seattle, Washington, August 9th – 10th, 2012. **C. D. Carothers - special invite participant**.
20. "DOE ICiS Workshop: Future of the Field", Workshop Organizers: Fred Streitz (DOE/LLNL), Richard Arthur (GE CRD) and Madhav Marathe (VaTech), Park City, Utah, August 7th – 11th, 2012. **C. D. Carothers - special invite participant**.
21. "DOE ASCR Exascale Research PI Meetings", Worshop Organizer: Bill Harrod, Director, Research Division, ASCR/DOE. Annapolis, Maryland, October, 11th –13th, 2011. **C. D. Carothers - special invite participant**.
22. "Supercomputer Storage System Models for the Age of Exascale Computing", Invited Presentation, 9th International Conference on Parallel Processing and Applied Mathematics (PPAM 2011), Torun, Poland, September 12th, 2011. **C. D. Carothers (presenter)**.
23. "Scalable Parallel I/O Alternatives for Massively Parallel Partitioned Solver Systems", Center for High-Performance Computing (CHPC), Cape Town, South Africa, July 15th, 2011. **C. D. Carothers (presenter)**.
24. "Life at the Near Petascale Edge: A Tale to Two Applications", Presented at the Robotics System Science Conference, Workshop 3 "Toward High-Performance Computing Support for the Analysis, Simulation, and Planning of Robotic Contact Tasks", June 27th, 2011. **C. D. Carothers (presen-**

ter).

25. "DOE ASCR Exascale Research PI Meetings", Worshop Organizer: Lee Ann Dudney, DOE/PNNL. San Diego, CA, March, 7th –11th, 2011. **C. D. Carothers - special invite participant**.
26. "Life at the Near Petascale Edge: A Tale to Two Applications", Presented at the IBM T. J. Watson, Yorktown Heights Facility. Hosted by the Exascale Computing Team, August 20th, 2009. **C. D. Carothers (presenter)**.
27. "Life at the Near Petascale Edge: A Tale to Two Applications", Presented at the General Electric Research Center's (GRC) Advanced Computing Group Seminar Series, April 9th, 2009. **C. D. Carothers (presenter)**.
28. "ROSS: Parallel Discrete-Event Simulation on Near Petasacle Supercomputers", Presented at the Airforce Research Labs, Rome, NY, April 1st, 2009. **C. D. Carothers (presenter)**.
29. "Research In Parallel and Distributed Simulation Systems," presented at the *GE Corporate Research and Development Center*, February, 22, 2002. **C. D. Carothers (presenter)**.
30. "ROSS: A High-Performance, Low Memory, Modular Time Warp System," presented at the *Rensselaer Department of Computer Science Colloquium Series*, November 2, 2000. **C. D. Carothers (presenter)**.
31. "ISSAC: An Intelligent System for Exploiting Speculative Execution and Active Code in Large-Scale Distributed Simulations," presented at the *1999 Dagsthul Workshop on Agent-Based Simulation*, Dagsthul, Germany, May 7, 1999. **C. D. Carothers (presenter)**.
32. "Efficient Optimistic Parallel Simulation Using Reverse Computation," presented at the *Rensselaer, Hartford CSI Seminar Series*, November 20, 1998. **C. D. Carothers (presenter)**.

X. Honors and Awards

1. **Rensselaer School of Engineering Research Team Award**, 2016.
2. **BEST PAPER** at the 2009 Workshop on Principals of Advanced and Distributed Simulation (PADS '09).
3. **BEST PAPER** at the 2003 Workshop on Parallel and Distributed Simulation (PADS '03).
4. **NSF CAREER Award** 2002.
5. **BEST PAPER** at the 1999 Workshop on Parallel and Distributed Simulation (PADS '99).
6. **MITRE Program Recognition Award, 1996** for contributions on the DoD High Level Architecture (HLA) project.

XI. **Sabbatical Leaves, Off-campus Study Programs and Foreign Professional Travel**

1. **South Africa:** Invited Speaker, Center for High-Performance Computing (CHPC), Cape Town, South Africa, July 15th, 2011.
2. **Sabbatical Leave:** GE Corporate Research and Development Center, Niskyuna, New York, October 2005 thru May, 2007.
3. **Dagsthul, Germany:** *Workshop on Agent-Based Simulation*, May 1999.

Date: _____ Signature: _____