

# Christopher D. Gill

Professor of Computer Science and Engineering  
Campus Box 1045  
Washington University  
One Brookings Drive  
St. Louis, MO 63130-4899  
Office: (314) 935-7538  
Department: (314) 935-6160  
Fax: (314) 935-7302  
cdgill@wustl.edu  
<http://www.cse.wustl.edu/~cdgill>

## Education

- 1997 – 2002 D.Sc. in Computer Science, Washington University in St. Louis, Dissertation titled “Flexible Scheduling in Middleware for Distributed Rate-Based Real-Time Applications.” Degree awarded May 2002.
- 1991 – 1997 M.S. in Computer Science, University of Missouri-Rolla, Masters Thesis titled “A Dictionary Based on Design Pattern Morphology.” Degree awarded May 1997.
- 1983 – 1987 B.A. *cum laude* in English and Biology, Washington University in St. Louis, Honors Thesis titled “Measure for Measure: The Comedy of Rigor.” Degree awarded May 1987.

## Professional Experience

- 2012 – present Professor of Computer Science and Engineering, Washington University, St. Louis, MO.
- 2007 – 2011 Associate Professor of Computer Science and Engineering, Washington University, St. Louis, MO.
- 2001 – 2007 Assistant Professor of Computer Science and Engineering, Washington University, St. Louis, MO.
- 1997 – 2001 Research Associate in Computer Science and Engineering, Washington University, St. Louis, MO.
- 1994 – 1997 Software Developer, SBC Communications, St. Louis, MO.
- 1993 – 1994 Software Developer, Teknivent Corp., St. Louis, MO.
- 1992 – 1993 Software Developer, Saleskit Software, St. Louis, MO.
- 1991 – 1992 System Administrator, Teknivent Corp., St. Louis, MO.
- 1989 – 1991 System Administrator, Prudential Group Health, St. Louis, MO.

## Honors and Awards

- 2022 Elevated to ACM Distinguished Member.
- 2016 Elevated to ACM Senior Member.
- 2016 Elevated to IEEE Senior Member.
- 2013 Named a member of the IEEE Computer Society's Golden Core, in recognition of service to the society.
- 2012 IEEE Computer Society Meritorious Service Award, for service as Treasurer of the IEEE Technical Committee on Real-Time Systems, 2009-2012
- 2012 ACM Recognition of Service Award, for service as Finance Chair for CPS Week 2012
- 2009 IEEE Service Award from the IEEE Technical Committee on Real-time Systems, for service as General co-Chair for RTAS 2009
- 2005 National Science Foundation CAREER award CCF-0448562, titled "Time and Event Based System Software Construction", Washington University, St. Louis, MO, September 2005-August 2011
- 2002 School of Engineering and Applied Sciences Graduate Student Recognition Ceremony Speaker, address titled "Let Us Now Begin", Washington University, St. Louis, MO, May 2002
- 1999 Boeing Fellowship Research Grant, titled "Dynamic Real-Time Scheduling for Multi-Dimensional QoS-Enabled Applications", Washington University, St. Louis, MO, July 1999 - June 2000
- 1998 USENIX Student Research Grant, "Developing and Evaluating a Flexible Framework for Dynamic Distributed Real-Time Scheduling", Washington University, St. Louis, MO, July 1998 - June 1999
- 1983 National Merit Scholar, Washington University, St. Louis, MO, August 1983 - May 1987

## Subjects Taught

I emphasize hands-on laboratory-based teaching methods focused on active learning, with personal attention to how fundamentals of computer science and understanding of programming languages and operating systems can be combined with software engineering techniques, to give students expertise and hands-on experience in designing and implementing high quality software.

- 2024 CSE 542S "Concurrency and Memory Safe System Software Development"
- 2017 – 2024 CSE 422S "Operating Systems Organization"

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| 2021 – 2024 | CSE 7900 “Research Seminar on Parallel Computing”                |
| 2022 – 2023 | CSE 428S “Multi-Paradigm Programming in C++”                     |
| 2016 – 2022 | CSE 522S “Advanced Operating Systems”                            |
| 2002 – 2021 | CSE 532S “Advanced Multi-Paradigm Software Development”          |
| 2009 – 2019 | CSE 7300 “Real-Time Systems Seminar”                             |
| 2000 – 2015 | CSE 332S “Object-Oriented Software Development Laboratory”       |
| 2012 – 2015 | CSE 425S “Programming Systems and Languages”                     |
| 2006 – 2009 | CSE 432S/533S “Pattern-Oriented Software Design and Development” |
| 2007        | CSE 436S “Software Engineering Workshop”                         |
| 2000 – 2006 | CSE 7216 “Research Seminar on Software Systems”                  |
| 2005        | CSE 232N “Programming Skills Workshop”                           |
| 2004        | CSE 131 “Computer Science I”                                     |

### **Doctoral Dissertations Supervised**

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|------|---|
| 2024 | Marion Sudvarg, Dissertation titled “Improved Models of Elastic Scheduling.”  |
| 2020 | Son Dinh (K. Agrawal and C. Gill co-advisors), Dissertation titled “Toward Efficient Scheduling for Parallel Real-Time Tasks on Multiprocessors.”         |
| 2019 | James Orr, Dissertation titled “Period and Computational Elasticity for Adaptive Real-Time Systems.”  |
| 2019 | Chao Wang (C. Lu and C. Gill co-advisors), Dissertation titled “Real-Time Reliable Middleware for Industrial Internet-of-Things.”                         |
| 2018 | David Ferry (K. Agrawal and C. Gill co-advisors), Dissertation titled “Concurrency Platforms for Real-Time and Cyber-Physical Systems.”                   |
| 2016 | Justin Wilson, Dissertation titled “A Transactional Model and Platform for Designing and Implementing Reactive Systems.”                                  |
| 2015 | John Meier (R. Chamberlain and C. Gill co-advisors), Dissertation titled “Spectrum Management using Markov Decision Processes.”                           |
| 2014 | Sisu Xi (C. Lu advisor, C. Gill co-advisor), Dissertation titled “Real-Time Virtualization and Cloud Computing.”  |
| 2012 | Huang-Ming Huang, Dissertation titled “MCFlow: Middleware for Mixed-Criticality Distributed Real-Time Systems.”   |
| 2011 | Terry Tidwell, Dissertation titled “Utility-Aware Scheduling of Stochastic Real-Time Systems.”  |
| 2008 | Yuanfang Zhang (C. Gill advisor, C. Lu co-advisor), Dissertation titled “Middleware Support for Real-Time Tasks on Distributed and Multi-Core Platforms.” |
| 2006 | Venkita Subramonian, Dissertation titled “Timed Automata Models for Principled Composition of Middleware.”  |

- 2005 Radu Handorean (G.-C. Roman advisor, C. Gill co-advisor), Dissertation titled “Context Aware Service Oriented Computing in Mobile Ad Hoc Networks.”
- 2004 Nanbor Wang (C. Gill advisor, D. Schmidt co-advisor), Dissertation titled “Composing Systemic Aspects into Component-Oriented DOC Middleware”

## **Doctoral Students Currently Advised**

Oren Bell, Steven Harris (co-advised with Roger Chamberlain), Tyler Martin, Marion Sudvarg, and Jordan Sun (co-advised with Roch Guerin and Kunal Agrawal)

## **Publications**

### **Refereed Journal Papers**

1. M. Sudvarg, Z. Sun, A. Li, C. Gill, and N. Zhang, "Priority-Based Concurrency and Shared Resource Access Mechanisms for Nested Intercomponent Requests in CAMkES", *Real-Time Systems* 60, April 2024, pp. 76-107 (special issue on selected papers from RTCSA 2022).
2. A. Zou, Y. Ma, K. Garimella, B. Lee, C. Gill, and X. Zhang, “F-LEMMA: Fast Learning-based Energy Management for Multi-/Many-core Processors”, *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD)* 42(2), February 2023.
3. A. Zou, J. Li, C. Gill, and X. Zhang, “RTGPU: Real-Time GPU Scheduling of Hard Deadline Parallel Tasks with Fine-Grain Utilization”, *IEEE Transactions on Parallel and Distributed Systems (TPDS)* 34(5), January 2023.
4. C. Li, S. Xi, C. Lu, R. Guerin, and C. Gill, "Virtualization-Aware Traffic Control for Soft Real-Time Network Traffic on Xen", *IEEE/ACM Transactions on Networking* 30(1), February 2022.
5. H. Li, C. Lu, and C. Gill, "RT-ZooKeeper: Taming the Recovery Latency of a Coordination Service," *ACM Transactions on Embedded Computing Systems (TECS)* 20(5S) Article 103, Special Issue on ESWEEK 2021 - Proceedings of ACM International Conference on Embedded Software (EMSOFT), September 2021.
6. M. Sudvarg, S. Baruah, and C. Gill, *Linear-Time Admission Control for Elastic Scheduling, Real-Time Systems*, Springer, July 2021.
7. A. Zou, J. Leng, X. He, Y. Zu, C. Gill, V. Reddi, X. Zhang, “Voltage-Stacked Power Delivery Systems: Reliability, Efficiency, and Power Management,” *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems* 39(12), pp. 5142-5155, December 2020.
8. A. Bloor, K. Garimella, X. He, C. Gill, Y. Vorobeychik and X. Zhang, “Attacking Vision-based Perception in End-to-End Autonomous Driving Models,” *Journal of Systems Architecture* 110, November 2020.

9. J. Condori, A. Maghareh, J. Orr, H.-W. Li, H. Montoya, S. Dyke, C. Gill, and A. Prakash, "Exploiting Parallel Computing to Control Uncertain Nonlinear Systems in Real-Time," *Experimental Techniques* 44, Special Issue on New Frontiers and Innovative Methods for Hybrid Simulation, pp. 735-749, Springer, June 2020.
10. C. Wang, C. Gill and C. Lu, "Real-Time Middleware for Cyber-Physical Event Processing," *ACM Transactions on Cyber-Physical Systems* 3(3) Article 29, Special Issue on Real-Time aspects in Cyber-Physical Systems, pp. 29:1-29:25, August 2019.
11. J. Orr, C. Gill, K. Agrawal, J. Li, and S. Baruah, "Elastic Scheduling for Parallel Real-Time Systems," *Leibniz Transactions on Embedded Systems (LITES)* 6(1), pp. 05:1-05:14, May 2019.
12. S. Dinh, J. Li, K. Agrawal, C. Gill and C. Lu, "Blocking Analysis for Spin Locks in Real-Time Parallel Tasks," *IEEE Transactions on Parallel and Distributed Systems*, 29(4): 789-802, April 2018.
13. J. Li, D. Ferry, S. Ahuja, K. Agrawal, C. Gill and C. Lu, "Mixed-Criticality Federated Scheduling for Parallel Real-Time Tasks," *Real-Time Systems*, Special Issue on Mixed-Criticality, Multi-Core, and Micro-Kernels, 53(5): 760–811, May 2017.
14. T. Fleming, H.-M. Huang, A. Burns, C. Gill, S. Baruah, C. Lu, "Corrections to and Discussion of 'Implementation and Evaluation of Mixed-criticality Scheduling Approaches for Sporadic Tasks'", *ACM Transactions on Embedded Computing Systems*, 16(3), Article 77, May 2017
15. M. Xu, L. Phan, O. Sokolsky, S. Xi, C. Lu, C. Gill, and I. Lee, "Cache-Aware Compositional Analysis of Real-Time Multicore Virtualization Platforms," *Real-Time Systems* 51(6), Special Issue on Best Papers of RTSS '13, pp. 675-723, November 2015.
16. J. Li, Z. Luo, D. Ferry, K. Agrawal, C. Gill and C. Lu, "Global EDF Scheduling for Parallel Real-Time Tasks", *Real-Time Systems* 51(4), Special Issue on Best Papers of ECRTS '13, pp. 395-439, July 2015.
17. A. Saifullah, D. Ferry, J. Li, K. Agrawal, C. Lu, and C. Gill, "Parallel Real-Time Scheduling of DAGs", *IEEE TPDS* 25(12), pp. 3242-3252, December 2014.
18. Q. Lu, J. Wilson, Y. Chen, C. Gill, L. Thomas, G.-C. Roman, G. Chen, "Situation-aware Composition and Execution in Dynamic Environments by Automated Planning", *Engineering Applications of Artificial Intelligence* 35, pp. 215-236, October 2014.
19. C. Kumar, S. Vyas, R. Cytron, C. Gill, J. Zambreno and P. Jones, "Hardware-Software Architecture for Priority Queue Management in Real-time and Embedded Systems", *International Journal of Embedded Systems* 6(4), pp. 319-334, September 2014.
20. H.-M. Huang, C. Gill and C. Lu, "Implementation and Evaluation of Mixed-Criticality Scheduling Approaches for Sporadic Tasks", *ACM TECS* 13(4s), Special Issue on Real-Time and Embedded Technology and Applications, Article 126, April 2014.
21. A. Saifullah, J. Li, K. Agrawal, C. Lu and C.D. Gill, "Multi-core Real-Time Scheduling for Generalized Parallel Task Models", *Real-Time Systems*, Special Issue on Best Papers of RTSS'11, Volume 49, Issue 4, pages 404-435, July 2013.

22. C. Kumar, S. Vyas, J. Shidal, R. Cytron, C. Gill, J. Zambreno, P. Jones, "Improving System Predictability and Performance via Hardware Accelerated Data Structures", *Procedia Computer Science* 9, pp. 1197-1205, January 2012.
23. Y. Zhang, C. Gill, and C. Lu, "Configurable Middleware for Distributed Real-Time Systems with Aperiodic and Periodic Tasks", *IEEE Transactions on Parallel and Distributed Systems* 21(3), pp. 393-404, March 2010.
24. R. Glaubius, T. Tidwell, C. Gill, and W. Smart, "Scheduling Policy Design for Autonomic Systems", *International Journal of Autonomous and Adaptive Communication Systems*, 2(3), pp. 276-296, June 2009.
25. X. Wang, C. Lu, and C. Gill, "FCS/nORB: A Feedback Control Real-Time Scheduling Service for Embedded ORB Middleware", *Microprocessors and Microsystems*, 32(8), pp. 413-424, November 2008.
26. X. Wang, M. Chen, H.-M. Huang, V. Subramonian, C. Lu, and C. Gill, "Control-Based Adaptive Middleware for Real-Time Image Transmission over Bandwidth-Constrained Networks", *IEEE Transactions on Parallel and Distributed Systems* 19(6), pp. 779-793, June 2008.
27. V. Subramonian, G. Deng, C. Gill, J. Balasubramanian, L.-J. Shen, W. Otte, D. Schmidt, A. Gokhale, and N. Wang, "The Design and Performance of Component Middleware for QoS-enabled Deployment and Configuration of DRE Systems", *Elsevier Journal of Systems and Software* 80(5), special issue on Component Based Software Engineering, pp. 668-677, March 2007.
28. R. Sen, R. Handorean, G.-C. Roman, G. Hackmann, and C. Gill, "Knowledge-driven Interactions across Mobile Ad Hoc Networks", *International Journal of Cooperative Information Systems*, 16(1), pp. 123-153, March 2007.
29. G. Xing, X. Wang, Y. Zhang, C. Lu, R. Pless, and C. Gill, "Integrated Coverage and Connectivity Configuration for Energy Conservation in Sensor Networks", *ACM Transactions on Sensor Networks*, 1(1), pp. 36-72, August 2005.
30. C. Gill, J. Gossett, J. Loyall, D. Schmidt, D. Corman, R. Schantz, and M. Atighetchi, "Integrated Adaptive QoS Management in Middleware: An Empirical Case Study", *Real-Time Systems*, special issue on **selected papers from RTAS 2004**, 29(2-3), pp. 101-130, March 2005.
31. C. Gill, Y. Krishnamurthy, D. Schmidt, I. Pyarali, L. Mgeta, Y. Zhang, and S. Torri, "Enhancing Adaptivity via Standard Dynamic Scheduling Middleware", *Journal of the Brazilian Computer Society*, special issue on Adaptive Systems, 10(1), pp. 19-30, July 2004.
32. C. Gill, D. Schmidt, and R. Cytron, "Multiparadigm Scheduling for Distributed Real-Time Embedded Computing", *IEEE Proceedings*, Special Issue on Modeling and Design of Embedded Systems, 91(1), pp. 183-197, January 2003.
33. N Wang, D. Schmidt, A. Gokhale, C. Gill, B. Natarajan, C. Rodrigues, J. Loyall, and R. Schantz, "Total Quality of Service Provisioning in Middleware and Applications", *Elsevier Journal of Microprocessors and Microsystems*, 27(2), pp. 45-54, March 2003.

34. C. Gill, D. Levine, and D. Schmidt “The Design and Performance of a Real-Time CORBA Scheduling Service”, *Real-Time Systems*, special issue on Real-Time Middleware, 20(2), pp. 117-154, March 2001

### Refereed Conference Papers

1. M. Sudvarg, D. Wang, J. Buhler and C. Gill, "Subtask-Level Elastic Scheduling," 45th IEEE Real-Time Systems Symposium (RTSS), December 10-13, 2024, York UK (accepted, to appear).
2. M. Sudvarg, C. Gill and S. Baruah, "Improved Implicit-Deadline Elastic Scheduling," 14th IEEE International Symposium on Industrial Embedded Systems (SIES), 23-25 October, 2024, Chengdu, China (accepted, to appear).
3. S. Kodali, J. Manin, L. Torres-Escobedo, R. Zhang, C. Ahrens, C. Gill, and R. Chamberlain, “Catoptric Surface Characteristics and Visual Feedback Control,” 19th IEEE Conference on Industrial Electronics and Applications (ICIEA), August 5-8 2024, Kristiansand, Norway.
4. M. Sudvarg, A. Li, D. Wang, S. Baruah, J. Buhler, P. Ekberg, C. Gill, and N. Zhang, “Elastic Scheduling for Harmonic Task Systems,” 30th IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS), May 2024, Hong Kong, China.
5. O. Bell, C. Gill, and X. Zhang, “Hardware Acceleration with Zero-Copy Memory Management for Heterogeneous Computing”, IEEE International Conference on Embedded and Real-Time Computing Systems and Applications (RTCSA), August 2023.
6. M. Sudvarg, J. Buhler, R. Chamberlain, C. Gill, J. Buckley, and W. Chen, “Parameterized Workload Adaptation for Fork-Join Tasks with Dynamic Workloads and Deadlines”, IEEE International Conference on Embedded and Real-Time Computing Systems and Applications (RTCSA), August 2023.
7. W. Xu, Z. Zhang, Y. Xu, J. Li, Y. Ma, Y. Jin, C. Gill, X. Zhang and A. Zou, “Energy Efficient Real-Time Scheduling on Heterogeneous Architectures with Self-Suspension Model”, ACM/IEEE International Symposium on Low Power Electronics and Design (ISLPED), August 2023.
8. M. Sudvarg, S. Baruah, and C. Gill, “Elastic Scheduling for Fixed-Priority Constrained-Deadline Tasks”, International Symposium On Real-Time Distributed Computing (ISORC), May 2023. **Best paper award.**
9. A. Li, M. Sudvarg, H. Liu, Z. Yu, C. Gill and N. Zhang, "PolyRhythm: Adaptive Tuning of a Multi-Channel Attack Template for Timing Interference," IEEE Real-Time Systems Symposium (RTSS), December 2022.
10. A. Sarkar, J. Feng, Y. Vorobeychik, C. Gill and N. Zhang, "Reward Delay Attacks on Deep Reinforcement Learning," Conference on Decision and Game Theory for Security (GameSec), October 2022.
11. M. Sudvarg and C. Gill, "A Concurrency Framework for Priority-Aware Intercomponent Requests in CAMkES on seL4," IEEE International Conference on Embedded and Real-Time Computing Systems and Applications (RTCSA), August 2022. **Best paper award.**

12. M. Sudvarg and C. Gill, "Analysis of Federated Scheduling for Integer-Valued Workloads," International Conference on Real-Time Networks and Systems (RTNS), June 2022.
13. C. Li, J. Liu, C. Lu, R. Guerin, and C. Gill, "Impact of Distributed Rate Limiting on Load Distribution in a Latency-sensitive Messaging Service," IEEE International Conference on Cloud Computing (CLOUD), September 2021.
14. H. Li, M. Xu, C. Li, C. Lu, C. Gill, L. Phan, I. Lee, and O. Sokolsky, "Towards Virtualization-Agnostic Latency for Time-Sensitive Applications," International Conference on Real-Time Networks and Systems (RTNS'21), April 2021. **Outstanding paper award.**
15. S. Harris, R. Chamberlain, C. Gill, "OpenCL Performance on the Intel Heterogeneous Architecture Research Platform," IEEE Conference on High Performance Extreme Computing (HPEC), September 2020.
16. S. Dinh, C. Gill, and K. Agrawal, "Efficient Deterministic Federated Scheduling for Parallel Real-Time Tasks," 26th IEEE International Conference on Embedded and Real-Time Computing Systems and Applications (RTCSA '20), August 2020.
17. J. Orr, J. Condori, C. Gill, S. Baruah, K. Agrawal, S. Dyke, A. Prakash, I. Bate, C. Wong, and S. Adhikari, "Elastic Scheduling of Parallel Real-Time Tasks with Discrete Utilizations," 28th International Conference on Real-Time Networks and Systems (RTNS '20), June 2020.
18. C. Wang, C. Gill and C. Lu, "Adaptive Data Replication in Real-Time Reliable Edge Computing for Internet of Things," ACM/IEEE International Conference on Internet of Things Design and Implementation (IoTDI'20), April 2020.
19. H. Li, C. Lu and C. Gill, "Predicting Latency Distributions of Aperiodic Time-Critical Services," IEEE Real-Time Systems Symposium (RTSS), December 2019.
20. C. Wang, C. Gill and C. Lu, "FRAME: Fault Tolerant and Real-Time Messaging for Edge Computing," 39th IEEE International Conference on Distributed Computing Systems (ICDCS), Dallas, TX, USA, July 2019.
21. A. Bloor, X. He, C. Gill, Y. Vorobeychik and X. Zhang, "Simple Physical Adversarial Examples against End-to-End Autonomous Driving Models," 15th IEEE International Conference on Embedded Software and Systems (ICCESS), Las Vegas, Nevada, USA, June, 2019.
22. A. Zou, J. Leng, X. He, Y. Zu, C. Gill, V. Reddi, S. Zhang, "Voltage-stacked GPUs: A Control Theory Driven Cross-Layer Solution for Practical Voltage Stacking in GPUs," 51<sup>st</sup> IEEE/ACM International Symposium on Microarchitecture (MICRO 51), Fukuoka, Japan, October 2018.
23. J. Orr, C. Gill, K. Agrawal, S. Baruah, C. Cianfarani, P. Ang, and C. Wong, "Elasticity of Workloads and Periods of Parallel Real-Time Tasks," 26<sup>th</sup> International Conference on Real-Time Networks and Systems (RTNS '18), Poitiers, France, October 2018.
24. H. Li, M. Xu, C. Li, C. Lu, C. Gill, L.T.X. Phan, I. Lee and O. Sokolsky, "Multi-Mode Virtualization for Soft Real-Time Systems," IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS'18), April 2018.
25. C. Wang, C. Gill and C. Lu, "Real-Time Middleware for Cyber-Physical Event Processing," ACM/IEEE International Symposium on Quality of Service (IWQoS'17), June 2017.



26. J. Li, S. Dinh, K. Kieselbach, K. Agrawal, C. Gill and C. Lu, “Randomized Work Stealing for Large Scale Soft Real-time Systems,” IEEE Real-Time Systems Symposium (RTSS), Porto, Portugal, December 2016.
27. J. Meier, C. Gill, and R. Chamberlain, “Combining Admission and Modulation Decisions for Wireless Embedded Systems,” 19<sup>th</sup> IEEE Symposium on Real-Time Computing (ISORC), Heslington, York, UK, May 2016.
28. J. Li, D. Ferry, S. Ahuja, K. Agrawal, C. Gill and C. Lu, “Mixed-Criticality Federated Scheduling for Parallel Real-Time Tasks,” IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS), Vienna, Austria, April 2016. **Outstanding Paper Award.**
29. S. Xi, C. Li, C. Lu, C. Gill, M. Xu, L. Phan, I. Lee, O. Sokolsky, “RT-OpenStack: CPU Resource Management for Real-Time Cloud Computing,” IEEE International Conference on Cloud Computing (CLOUD), New York, NY, USA, June 2015.
30. C. Li, S. Xi, C. Lu, C. Gill and R. Guerin, “Prioritizing Soft Real-Time Network Traffic in Virtualized Hosts Based on Xen,” IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS), Seattle, WA, USA, April 2015.
31. S. Xi, M. Xu, C. Lu, L. Phan, C. Gill, O. Sokolsky, I. Lee, “Real-Time Multi-Core Virtual Machine Scheduling in Xen”, International Conference on Embedded Software (EMSOFT), New Delhi, India, October 2014.
32. D. Ferry, G. Bunting, A. Megareh, S. Dyke, A. Prakash, K. Agrawal, C. Gill and C. Lu, “Real-Time System Support for Hybrid Structural Simulation,” International Conference on Embedded Software (EMSOFT), New Delhi, India, October 2014.
33. J. Li, K. Agrawal, C. Gill, and C. Lu, “Federated Scheduling for Stochastic Parallel Real-time Tasks,” 20<sup>th</sup> IEEE International Conference on Embedded and Real-Time Computing Systems and Applications (RTCSA), Chongqing, China, August 2014.
34. J. Li, J.-J. Chen, K. Agrawal, C. Lu, C. Gill and A. Saifullah, “Analysis of Federated and Global Scheduling for Parallel Real-Time Tasks,” Euromicro Conference on Real-Time Systems (ECRTS), Madrid, Spain, July 2014.
35. D. Ferry, A. Megareh, G. Bunting, A. Prakash, K. Agrawal, C. Gill, C. Lu and S. Dyke, “On the Performance of a Highly Parallelizable Concurrency Platform for Real-Time Hybrid Simulation,” 6<sup>th</sup> World Conference on Structural Control and Monitoring (6WCSCM), Barcelona, Spain, July 2014.
36. M. Xu, L.T.X. Phan, I. Lee, O. Sokolsky, S. Xi, C. Lu and C. Gill, “Cache-Aware Compositional Analysis of Real-Time Multicore Virtualization Platforms,” IEEE Real-Time Systems Symposium, (RTSS), Vancouver, BC, Canada, December 2013.
37. J. Meier, S. Sistla, B. Karaus, C. Gill, R. Chamberlain, and T. Tidwell, “Assessing the Appropriateness of using Markov Decision Processes for RF Spectrum Management,” 16th ACM International Conference on Modeling, Analysis [and] Simulation of Wireless and Mobile Systems (MSWiM), Barcelona, Spain, November 2013.
38. J. Li, K. Agrawal, C. Lu and C. Gill, “Analysis of Global EDF for Parallel Tasks,” Euromicro Conference on Real-Time Systems (ECRTS), Paris, France, July 2013. **Outstanding paper award.**

39. S. Xi, C. Li, C. Lu and C. Gill, "Prioritizing Local Inter-Domain Communication in Xen," ACM/IEEE International Symposium on Quality of Service (IWQoS), Montreal, Canada, June 2013.
40. D. Ferry, J. Li, M. Mahadevan, K. Agrawal, C.D. Gill and C. Lu, "A Real-Time Scheduling Service for Parallel Tasks," IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS), Philadelphia, PA, April 2013.
41. H. Huang, C. Gill, C. Lu, "MCFlow: a Real-time Multi-core Aware Middleware for Dependent Task Graphs," 18<sup>th</sup> IEEE International Conference on Embedded and Real-Time Computing Systems and Applications (RTCSA), Seoul, Korea, August 2012.
42. J. Lee, S. Xi, S. Chen, L.T.X. Phan, C. Gill, I. Lee, C. Lu and O. Sokolsky, "Realizing Compositional Scheduling through Virtualization," IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS), Beijing, China, April 2012.
43. H.-M. Huang, C. Gill and C. Lu, "Implementation and Evaluation of Mixed-Criticality Scheduling Approaches for Periodic Tasks," IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS), Beijing, China, April 2012.
44. A. Saifullah, K. Agrawal, C. Lu and C. Gill, "Multi-core Real-Time Scheduling for Generalized Parallel Task Models," 32<sup>nd</sup> Real-Time Systems Symposium (RTSS), Vienna, Austria, November 29-December 2, 2011. **Best student paper award.**
45. S. Xi, J. Wilson, C. Lu, C. Gill, "RT-Xen: Towards Real-Time Hypervisor Scheduling in Xen," International Conference on Embedded Software (EMSOFT), Taipei, Taiwan, October 9-14, 2011.
46. J. Meier, C. Gill, R. Chamberlain, "Towards More Effective Spectrum Use Based on Memory Allocation Models," 35<sup>th</sup> IEEE Computer Software and Applications Conference (COMPSAC), Munich, Germany, July 18-22, 2011.
47. T. Tidwell, C. Bass, E. Lasker, M. Wylde, C. Gill, and W. Smart, "Scalable Utility Aware Scheduling Heuristics for Real-time Tasks with Stochastic Non-preemptive Execution Intervals," 23<sup>rd</sup> Euromicro Conference on Real-Time Systems (ECRTS), Porto, Portugal, July 6-8, 2011.
48. T. Tidwell, R. Glaubius, C. Gill, and W. Smart, "Optimizing Expected Time Utility in Cyber-Physical Systems Schedulers," 31<sup>st</sup> Real-Time Systems Symposium (RTSS), San Diego, CA, November 30-December 3, 2010.
49. R. Glaubius, T. Tidwell, C. Gill, and W. Smart, "Real-Time Scheduling via Reinforcement Learning," 26<sup>th</sup> Conference on Uncertainty in Artificial Intelligence (UAI), Catalina Island, CA, July 8-11, 2010.
50. R. Glaubius, T. Tidwell, B. Sidoti, D. Pilla, J. Meden, C. Gill and W. Smart, "Scalable Scheduling Policy Design for Open Soft Real-Time Systems," IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS), Stockholm, Sweden April 12-15, 2010. **Best student paper award.**

51. J. Balasubramanian, A. Gokhale, A. Dubey, F. Wolf, C. Lu, C. Gill and D. Schmidt, "Middleware for Resource-Aware Deployment and Configuration of Fault-tolerant Real-time Systems," IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS), Stockholm, Sweden April 12-15, 2010.
52. H.-M. Huang, X. Gao, T. Tidwell, C. Gill, C. Lu and S. Dyke, "Cyber-Physical Systems for Real-Time Hybrid Structural Testing: A Case Study," 1<sup>st</sup> ACM/IEEE International Conference on Cyber-Physical Systems (ICCPS), Stockholm, Sweden April 12-15, 2010.
53. R. Sowell, C. Gill, R. Chamberlain, C. Grimm, K. Goldman, M. Tranel, "The Active-Learning Transformation: A Case Study in Software Development and Systems Software Courses," 16<sup>th</sup> annual CCSC Central Plains regional conference, Parkville, MO, April 9 and 10, 2010.
54. L. Thomas, J. Wilson, G.-C. Roman, C. Gill, "Achieving Coordination Through Dynamic Construction of Open Workflows," ACM/IFIP/USENIX 10th International Middleware Conference (Middleware '09) Urbana-Champaign, IL, USA, November 30 - December 4, 2009
55. Y. Zhang, C. Gill, and C. Lu "Real-Time Performance and Middleware for Multiprocessor and Multicore Linux Platforms," IEEE International Conference on Embedded and Real-Time Computing Systems and Applications (RTCSA '09), Beijing, China, August 24-26, 2009.
56. J. Balasubramanian, S. Tambe, C. Lu, A. Gokhale, C. Gill, and D. Schmidt "Adaptive Failover for Real-time Middleware with Passive Replication," IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS '09), San Francisco, CA, April 13-16, 2009.
57. R. Glaubius, T. Tidwell, W. Smart, and C. Gill, "Scheduling Design and Verification for Open Soft Real-Time Systems," 29th Real-Time Systems Symposium (RTSS '08), Barcelona, Spain, November 30 - December 3, 2008.
58. Y. Zhang, D. Kreckler, C. Gill, C. Lu, and G. Thaker, "Practical Schedulability Analysis for Generalized Sporadic Tasks in Distributed Real-Time Systems," 20th Euromicro Conference on Real-Time Systems (ECRTS '08), Prague, Czech Republic July 2-4, 2008.
59. T. Tidwell, R. Glaubius, C. Gill, and W. Smart, "Scheduling for Reliable Execution in Autonomic Systems," 5th International Conference on Autonomic and Trusted Computing (ATC '08), Oslo, Norway, June 23-25, 2008.
60. Y. Zhang, C. Gill and C. Lu, "Reconfigurable Real-Time Middleware for Distributed Cyber-Physical Systems with Aperiodic Events," 28th International Conference on Distributed Computing Systems (ICDCS '08), Beijing, China June 17 - 20, 2008.
61. R. Sen, G.-C. Roman and C. D. Gill, "CiAN: A Workflow Engine for MANETs," 10th International Conference on Coordination Models and Languages (Coordination '08), Oslo, Norway, June 4-6, 2008, LNCS 5052, pp. 280-295.
62. G. Hackmann, C. Gill and G.-C. Roman, "Extending BPEL for Interoperable Pervasive Computing," IEEE International Conference on Pervasive Services (ICPS '07), Istanbul, Turkey July 15 - 20, 2007.

63. R. Sen, G. Hackmann, M. Haitjema, G.-C. Roman and C. Gill, "Coordinating Workflow Allocation & Execution in Mobile Environments," 9th International Conference on Coordination Models and Languages (Coordination '07), Paphos, Cyprus, June 5-8, 2007, LNCS 4467, pp. 249-267.
64. Y. Zhang, C. Lu, C. Gill, P. Lardieri, and G. Thaker, "Middleware Support for Aperiodic Tasks in Distributed Real-Time Systems," 13th IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS '07), Bellvue, WA, USA, April 3-6, 2007, pp. 497-506.
65. C. Sanchez, H. Sipma, C. Gill, and Z. Manna, "Distributed Priority Inheritance for Real-Time and Embedded Systems," 10<sup>th</sup> International Conference On Principles Of Distributed Systems (OPODIS '06), Bordeaux, France, December 12-15, 2006, pp. 110-125.
66. G. Hackmann, M. Haitjema, C. Gill, and G.-C. Roman, "Sliver: A BPEL Workflow Process Execution Engine for Mobile Devices," 4<sup>th</sup> International Conference on Service Oriented Computing (ICSOC '06), Chicago, IL, USA, December 4-7, 2006, pp. 503-508.
67. V. Subramonian, C. Gill, C. Sanchez, and H. Sipma, "Reusable Models for Timing and Liveness Analysis of Middleware for Distributed Real-Time Embedded Systems," 6<sup>th</sup> ACM Conference on Embedded Software (EMSOFT '06), Seoul, South Korea, October 22-25, 2006, pp. 252-261.
68. C. Sanchez, H. Sipma, Z. Manna, and C. Gill, "Efficient Distributed Deadlock Avoidance with Liveness Guarantees," 6<sup>th</sup> ACM Conference on Embedded Software (EMSOFT '06), Seoul, South Korea, October 22-25, 2006, pp. 12-20. **SIGBED Frank Anger Memorial student paper award.**
69. H.-M. Huang and C. Gill, "Design and Performance of a Fault-Tolerant Real-Time CORBA Event Service," 18th Euromicro Conference on Real-Time Systems (ECRTS '06), Dresden, Germany, July 5-7, 2006, pp. 33-42.
70. A. Borg, A. Wellings, C. Gill, and R. Cytron, "Real-Time Memory Management: Life and Times," 18th Euromicro Conference on Real-Time Systems (ECRTS '06), Dresden, Germany, July 5-7, 2006, pp. 237-247.
71. C. Sanchez, H. Sipma, Z. Manna, V. Subramonian, and C. Gill, "On Efficient Distributed Deadlock Avoidance for Real-Time and Embedded Systems," 20<sup>th</sup> IEEE International Parallel and Distributed Processing Symposium (IPDPS '06), April 25 – 29, 2006, Rhodes, Greece, pp. 1-10.
72. C. Sanchez, H. Sipma, V. Subramonian, C. Gill, and Z. Manna, "Thread Allocation Protocols for Distributed Real-Time and Embedded Systems," 25th IFIP WG 6.1 International Conference on Formal Techniques for Networked and Distributed Systems (FORTE '05), Taipei, Taiwan, Oct 2-5, 2005, pp. 159-173.
73. Y. Zhang, B. Thrall, S. Torri, C. Gill, and C. Lu, "A Real-Time Performance Comparison of Distributable Threads and Event Channels," 11th IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS '05), San Francisco, CA, USA, March 7-10, 2005, pp. 497-506.

74. T. Aswathanarayana, V. Subramonian, D. Niehaus and C. Gill, "Design and Performance of Configurable Endsystem Scheduling Mechanisms," 11th IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS '05), San Francisco, CA, USA, March 7-10, 2005, pp. 32-43.
75. K. Bryan, L. DiPippo, V. Fay-Wolfe, M. Murphy, J. Zhang, D. Fleeman, D. Juedes, C. Liu, L. Welch, D. Niehaus, and C. D. Gill, "Integrated CORBA Scheduling and Resource Management for Distributed Real-Time Embedded Systems," 11th IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS '05), San Francisco, CA, USA, March 7-10, 2005, pp. 375-384.
76. V. Subramonian, N. Wang, L.-J. Shen, and C. Gill, "The Design and Performance of Configurable Component Middleware for Distributed Real-Time and Embedded Systems," 25<sup>th</sup> IEEE International Real-Time Systems Symposium (RTSS '04), Lisbon, Portugal, December 5-8, 2004, pp. 252-261.
77. N. Wang, C. Gill, D. Schmidt, and V. Subramonian, "Configuring Real-Time Aspects in Component Middleware," International Symposium on Distributed Objects and Applications (DOA '04), Agia Napa, Cyprus, October 25-29, 2004, pp. 1520-1537.
78. C. Gill, J. Gossett, J. Loyall, D. Schmidt, D. Corman, R. Schantz, and M. Atighetchi, "Integrated Adaptive QoS Management in Middleware: An Empirical Case Study," 10<sup>th</sup> IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS '04) Toronto, Canada, May 25-28, 2004, pp. 276-285.
79. V. Subramonian, G. Xing, C. Gill, C. Lu, and R. Cytron, "Middleware Specialization for Memory-Constrained Networked Embedded Systems," 10<sup>th</sup> IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS '04) Toronto, Canada, May 25-28, 2004, pp. 306-313.
80. Y. Krishnamurthy, C. Gill, D. Schmidt, I. Pyarali, L. Mgeta, Y. Zhang, and S. Torri, "The Design and Implementation of Real-Time CORBA 2.0: Dynamic Scheduling in TAO," 10<sup>th</sup> IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS '04) Toronto, Canada, May 25-28, 2004, pp. 121-129.
81. P. Gore, C. Gill, D. Schmidt, and I. Pyarali, "The Design and Performance of a Real-Time Notification Service," 10<sup>th</sup> IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS '04) Toronto, Canada, May 25-28, 2004, pp. 112-120.
82. X. Wang, H.-M. Huang, V. Subramonian, C. Lu, and C. Gill, "CAMRIT: Control-based Adaptive Middleware for Real-time Image Transmission," 10<sup>th</sup> IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS '04) Toronto, Canada, May 25-28, 2004, pp. 296-305.
83. R. Handorean, C. Gill and G.-C. Roman, "Accommodating Transient Connectivity in Ad Hoc and Mobile Settings," 2<sup>nd</sup> International Conference on Pervasive Computing (Pervasive '04), Vienna, Austria, April 18-24, 2004, pp. 305-322.
84. N. Wang and C. Gill, "Improving Real-Time System Configuration via a QoS-aware CORBA Component Model," 37<sup>th</sup> Hawaii International Conference on System Sciences (HICSS '04), Kona, Hawaii, USA, January 5-9, 2004, pp. 1-10.

85. V. Subramonian and C. Gill, "A Generative Programming Framework for Adaptive Middleware," 37<sup>th</sup> Hawaii International Conference on System Sciences (HICSS '04), Kona, Hawaii, USA, January 5-9, 2004, pp. 1-10 (acceptance rate 33% in AESS mini-track). **Best paper award in the Software Technology track.**
86. G. Xing, X. Wang, Y. Zhang, C. Lu, R. Pless, and C. Gill, "Integrated Coverage and Connectivity Configuration in Wireless Sensor Networks," 1<sup>st</sup> ACM Conference on Embedded Networked Sensor Systems (SenSys '03), Los Angeles, CA, USA, November 5-7, 2003, pp. 28-39.
87. X. Wang, C. Lu, and C. Gill, "Feedback Control Real-Time Scheduling in ORB Middleware," 9<sup>th</sup> IEEE Real-Time Technology and Applications Symposium (RTAS '03), Washington, DC, USA, May 27-30, 2003, pp. 37-48.
88. C. Gill, F. Kuhns, D. Schmidt, and R. Cytron, "Empirical Differences Between COTS Middleware Scheduling Strategies," 4<sup>th</sup> International Symposium on Distributed Objects and Applications (DOA '02), Irvine, CA, USA, October 28-30, 2002, pp. 922-948.
89. A. Corsaro, D. Schmidt, C. Gill, and R. Cytron, "Formalizing Meta-Programming Techniques to Reconcile Heterogeneous Scheduling Disciplines in Open Distributed Real-Time Systems," 3<sup>rd</sup> International Symposium on Distributed Objects and Applications (DOA '01), Rome, Italy, September 8-10, 2001, pp. 289-298.
90. J. Loyall, J. Gossett, C. Gill, R. Schantz, J. Zinky, P. Pal, R. Shapiro, C. Rodrigues, M. Atighetchi, and D. Karr, "Comparing and Contrasting Adaptive Middleware Support in Wide-Area and Embedded Distributed Object Applications," 21<sup>st</sup> International Conference on Distributed Computing Systems (ICDCS '01), Phoenix, AZ, USA, April 16-19, 2001, pp. 625-634.

## Book Chapters

1. G. Deng, D. Schmidt, C. D. Gill, and N. Wang, "QoS-Enabled Component Middleware for Distributed Real-Time and Embedded Systems", Handbook of Real-Time and Embedded Systems (I. Lee, J. Leung, and S. Son, eds.), 2008, CRC Press ch. 15, pp. 1-16, ISBN 978-1-58488-678-5.
2. V. Subramonian and C. Gill, "Middleware Design and Implementation for Networked Embedded Systems", Embedded Systems Handbook (R. Zurawski, ed.), CRC Press, Florida, August 2005, pp. 30.1-30.17. ISBN 0-8493-2824-1 (first edition), 9781439807613 (second edition).
3. R. Sen, R. Handorean, G.-C. Roman, and C. Gill, "Service Oriented Computing Imperatives in Ad Hoc Wireless Settings ", Service Oriented Software Engineering: Challenges and Practices, (Z. Stojanovic and Ajantha Dahanayake, eds.), Idea Group Publishing, 2005, pp. 247-269. ISBN 1-59140-427-4
4. N. Wang, D. Schmidt, A. Gokhale, C. Rodrigues, B. tarajan, J. Loyall, R. Schantz, and C. Gill, "QoS-enabled Middleware", Middleware for Communications (Qusay Mahmoud, ed.), New York, Wiley & Sons, 2004, pp. 131-162. ISBN 0-470-86206-8

5. D. Levine, C. Gill, and D. Schmidt, “Object Lifetime Manager – A Complementary Pattern for Controlling Object Creation and Destruction”, Design Patterns in Communications Software, Linda Rising, ed., Cambridge University Press, 2001, pp. 495-534. ISBN 0-521-79040-9

### **Invited Journal Papers**

1. M. Sudvarg, O. Bell, T. Martin, B. Standaert, T. Zhang, S.-B. Kwon, C. Gill, and A. Prakash, [Towards a concurrency platform for scalable multi-axial real-time hybrid simulation](#), Frontiers in the Built Environment Vol. 10, September 2024, Special Issue on Earthquake Engineering.

### **Invited Conference Papers**

2. M. Lohstroh, M. Schoeberl, A. Goens, A. Wasicek, C. Gill, M. Sirjani, and E. A. Lee, “Invited: Actors Revisited for Time-Critical Systems,” Design Automation Conference (DAC), Las Vegas, Nevada, USA, June, 2019.
3. J. White, C. Gill, and D. Schmidt, “Elastic Software Infrastructure to Support Computing Clouds for CPS (CC4CPS),” 17<sup>th</sup> IEEE International Symposium on Object and Component-Oriented Real-Time Distributed Computing (ISORC), Reno, Nevada, USA, June 2014.
4. X. Gao, N. Castaneda, S. Dyke, S. Xi, C. Gill and C. Lu, “Experimental Validation of a Scaled Instrumentation for Real-time Hybrid Testing,” 2011 American Control Conference (ACC), San Francisco, CA, USA, June 29 - July 1, 2011.
5. T. Tidwell, X. Gao, H-M. Huang, C. Lu, S. Dyke, and C. Gill “Towards Configurable Real-Time Hybrid Structural Testing: A Cyber-Physical Systems Approach,” IEEE International Symposium on Object and Component-Oriented Real-Time Distributed Computing (ISORC), Tokyo, Japan, March 17-20, 2009.
6. C. Gill, “Resource Virtualization in Real-Time CORBA Middleware,” International Conference on Hardware/Software Codesign and System Synthesis (CODES+ISSS '06), Seoul, South Korea, October 22-25, 2006.

### **Invited Talks**

1. C. Gill, “Real-Time Virtualization, Concurrency Platforms, and Middleware,” TECoSA Seminar (on-line), ITM School, KTH Royal Institute of Technology, March 4, 2021.
2. C. Gill, “Towards Bespoke Graceful Degradation in Mixed-Criticality Systems,” panel presentation at the 6<sup>th</sup> International Workshop on Mixed-Criticality Systems (WMC), at RTSS 2018, December 11, 2018.
3. C. Gill, “Advances in Parallel Real-Time Cyber-Physical Systems,” Seminar talk at the University of California, Berkeley, December 3, 2018.
4. C. Gill, “Advances in Parallel Real-Time Cyber-Physical Systems,” Seminar talk at George Washington University, November 14, 2018.

5. C. Gill, "Future Cyber-Physical Systems Platforms," Future of CPS Panel, International Workshop on Next-Generation Cyber-Physical Systems, University of Virginia, September 15, 2018.
6. C. Gill, "Advances in Parallel Real-Time Cyber-Physical Systems," Seminar talk at the University of Texas at Dallas, February 16, 2018.
7. C. Gill, "Cyber-Physical Semantics in Real-Time Hybrid Simulation," Seminar talk at the Missouri University of Science and Technology, Rolla, MO, September 1, 2015.
8. C. Gill, "Building Current and Future Faculty (a Report from the Front Lines)", Workshop on 21<sup>st</sup> Century Cyber-Physical Systems Education: Developing Solutions, National Academy of Sciences, Washington, DC, USA, October 3, 2014.
9. C. Gill, "Real-Time Scheduling and Platform Support for Cyber-Mechanical Systems", CS Dept. colloquium presentation at the University of Iowa, Iowa City, IA, September 20, 2013
10. C. Gill, "Progress and Challenges for Real-Time Virtualization", keynote talk at the 1<sup>st</sup> Workshop on Virtualization for Real-Time Embedded Systems (VtRES '13 at RTCSA '13), Taipei, Taiwan, August 21, 2013
11. C. Gill, "Real-Time Scheduling and Platform Support for Cyber-Mechanical Systems", CS Dept. colloquium presentation at George Washington University, Washington, DC, March 13, 2013
12. C. Gill, "CPS Scheduling Policy Design with Utility and Stochastic Execution", GA Tech Cyber-Physical Systems Summer School, Atlanta, GA, June 23-25, 2010
13. C. Gill, "Non-Preemptive Scheduling Policy Design for Tasks with Stochastic Execution Times," invited speaker, Cyber-Physical Systems Seminar, University of Pennsylvania, Philadelphia, PA, USA, November 23, 2009
14. C. Gill, "Non-Preemptive Scheduling Policy Design for Tasks with Stochastic Execution Times," invited speaker, CS Systems Symposium, University of North Carolina, Chapel Hill, NC, USA, November 20, 2009
15. C. Gill, "Towards Assurance for Open Soft Real-Time Systems", invited speaker, 3<sup>rd</sup> USAF / Raytheon Layered Assurance Workshop, San Antonio TX, USA, August 5, 2009
16. C. Gill, "Time and Event Based System Software Design and Verification", invited talk at the Instituto Madrileño de Estudios Avanzados (IMDEA), Madrid, Spain, Fri Jun 27, 2008
17. C. Gill, "Open-source and Proprietary Software Development", Conference on Open-Source and Proprietary Models of Innovation: Beyond Ideologies, April 4, 2008, Law School, Washington University in St. Louis.
18. C. Gill, "Cyber-Physical System Software for HCMDSS", Joint Workshop on High Confidence Medical Devices, Software, and Systems (HCMDSS) and Medical Device Plug-and-Play (MD PnP) Interoperability, June 25-27, 2007 Boston, MA
19. C. Gill, "Real-Time ORB Middleware: Standards, Applications, and Variations", Robotics Domain Task Force invited talk, OMG Technical Committee Meeting, St. Louis, MO, Tuesday, April 25th, 2006. (OMG document robotics/2006-04-09).



20. C. Gill, "Towards Verifiable Embedded Real-Time System Implementation," Panel on Grand Challenges in Embedded Systems, ERTSI Workshop at RTSS 2005, Miami, FL, Monday, December 5th, 2005
21. C. Gill, "Time and Event Based System Software Construction", CS Department Invited Talk, University of Missouri-Rolla, Rolla, MO, October 28, 2005.
22. C. Gill, "Time and Event Based System Software Construction", Invited Lecture in the EECS Department Colloquium Series, Vanderbilt University, Nashville, TN, October 13, 2005.
23. C. Gill, "Advances in Middleware for Distributed Real-Time Embedded Systems", invited presentation to the Washington University School of Engineering and Applied Science National Council Meeting, Thursday, May 5, 2005.
24. C. Gill, "Towards Principled Construction of Trusted System Software", invited presentation, Air Force Research Labs, Dayton, OH, December 15, 2004
25. C. Gill, "Application-Customized System Software", invited talk at The Homag Group, Schopfloch, Germany, December 4, 2004
26. C. Gill, "An Evolution of Endsystem Scheduling Techniques", invited talk, Department of Computer Science, University of Rhode Island, Kingston, RI, September 20, 2004
27. C. Gill, "Washington University Quality of Service (QoS) Research Relevant to NCO DAIT", invited presentation to the Boeing Network Centric Operations DAIT Integration meeting (with John Lockwood and Fred Kuhns), St. Louis, MO, February 16, 2004.
28. C. Gill, "Composing Just Enough Middleware", Invited Lecture, Università degli Studi di Napoli Federico II, Italy, September 29, 2003
29. C. Gill, "Research Challenges in the ORDS Community (in the Coming Years)", WORDS 2003 Fall panel, Anacapri, Italy, October 2003
30. C. Gill, "QoS in Systems of Systems", RTAS 2003 Panel: Advances in Large-Scale Distributed Real-time and Embedded Systems, May 2003
31. C. Gill, "OO and Real-time, a Valuable Combination of Incompatible Concepts", *Panel: Object-orientation and Real-time, a Valuable Combination, or Incompatible Concepts?*, Eighth IEEE International Workshop on Object-oriented Real-time Dependable Systems (WORDS), January, 17, 2003, Guadalajara, Mexico.
32. C. Gill, "Distributed and Mobile Systems", Washington University Center for Security Technologies Annual Review presentation, January 13, 2003, St. Louis, MO
33. C. Gill, "Middleware Research Directions", Invited talk at the Rockwell Collins Advanced Technology Center, January 10, 2003, Cedar Rapids, Iowa.
34. C. Gill, "Programming in a Multi-Paradigm World", Invited talk at SBC Communications, November 11, 2002, St. Louis, MO.
35. C. Gill, "Applying a Flexible Middleware Scheduling Framework to Optimize Distributed and Embedded Real-Time Systems," Research Staff Interview Talk, BBN Technologies, April 13, 2001.

36. C. Gill, "Applying a Flexible Middleware Scheduling Framework to Optimize Distributed and Embedded Real-Time Systems," Tenure-Track Faculty Interview Talk, University of Colorado, Boulder, CO, April 9, 2001.
37. C. Gill, "Applying a Flexible Middleware Scheduling Framework to Optimize Distributed and Embedded Real-Time Systems, Tenure-Track Faculty Interview Talk," Washington University, St. Louis, MO, April 6, 2001.
38. C. Gill, "Applying a Flexible Middleware Scheduling Framework to Optimize Distributed and Embedded Real-Time Systems, Boeing Fellowship Research Presentation," The Boeing Company, St. Louis, MO, April 5, 2001.
39. C. Gill, "Applying a Flexible Middleware Scheduling Framework to Optimize Distributed and Embedded Real-Time Systems," Tenure-Track Faculty Interview Talk, Washington State University, Pullman, WA, March 26, 2001.
40. C. Gill, "Applying a Flexible Middleware Scheduling Framework to Optimize Distributed and Embedded Real-Time Systems," Research Staff Interview Talk, Lockheed Martin Advanced Technology Labs, March 9, 2001.
41. C. Gill, "Implementing the OMG Real-Time CORBA 1.0 Specification in TAO," Presented to the OMG Real-Time PSIG's Real-Time CORBA 1.0 Implementer's Panel and to the DARPA ITO Quorum PI meeting (both in Orlando, FL, December 2000).
42. C. Gill, "Static and Dynamic Scheduling Using the RT-CORBA QoS Framework," presented at the Boeing Company, St. Louis, MO, January 25, 1999.
43. C. Gill, "Dynamic Scheduling for Real-Time CORBA," presented at Real-Time PSIG panel on Dynamic Scheduling, OMG TC Meeting, Washington, DC, January 11, 1999.

## **Professional Service**

### **IEEE Technical Committee for Real-Time Systems (TCRTS)**

Executive Committee Member (Past Chair) 2024-2025; TCRTS Chair 2022-2023; TCRTS Vice-Chair 2020-2021; Executive Committee Member (Cost Savings Subcommittee Chair) 2016-2017; TCRTS Treasurer (primary responsibility for RTSS and RTAS conference finances, served as overall Finance Chair for CPS Week 2011 and CPS Week 2012), 2009-2012

### **ACM Special Interest Group on Embedded Systems (SIGBED)**

Executive Committee Member (Awards Committee Chair), 2020-2021; SIGBED Vice-Chair, 2013-2015

### **Journal Editorial Boards**

Associate Editor for ACM Transactions on Cyber-Physical Systems, 2015-present

Subject Area Editor for Elsevier Journal of Systems Architecture, 2018-present

## **Steering Committee Chair**

Chair, CPS-IoT Week Steering Committee, September 2022-present.

## **Conference General Chair**

General co-Chair (with Bruno Sinopoli) for the 9<sup>th</sup> ACM/IEEE International Conference on Cyber-Physical Systems (ICCPS '18), Porto, Portugal, April 2018.

General Chair for the 36<sup>th</sup> IEEE Real-Time Systems Symposium (RTSS '15), San Antonio, TX, December 1-4, 2015.

General Co-Chair (with Chenyang Lu) for the 15<sup>th</sup> IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS '09), San Jose, CA, USA, April 13-16, 2009.

General Co-Chair (with Oleg Sokolsky and Doug Stuart) for the 12<sup>th</sup> IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS '06), San Jose, CA, USA, April 4-7, 2006.

## **Conference Technical Program Committee Chair**

Program co-Chair (with Ye-Qiong Song), 27<sup>th</sup> International Conference on Real-Time Networks and Systems, (RTNS '19), Toulouse, France, November 2019.

Program co-Chair (with Bruno Sinopoli), 8<sup>th</sup> ACM/IEEE International Conference on Cyber-Physical Systems (ICCPS '17), Pittsburgh, PA, April 2017.

Program Chair, 35<sup>th</sup> IEEE Real-Time Systems Symposium (RTSS '14), Rome, Italy, December 2014.

Program Vice-Chair (Real-Time Systems Track), 19<sup>th</sup> IEEE International Conference on Embedded and Real-Time Computing Systems and Applications (RTCSA '13), Taipei, Taiwan, August 19-22, 2013.

Program Vice-Chair (Fault Tolerance and Dependability), 31<sup>st</sup> IEEE International Conference on Distributed Computing Systems (ICDCS), Minneapolis, MN, USA, June 20-24, 2011.

Program Vice-Chair (Multimedia Systems), 28<sup>th</sup> IEEE International Conference on Distributed Computing Systems (ICDCS), Beijing, China, June 17-20, 2008.

Program co-Chair (with Chenyang Lu), 14<sup>th</sup> IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS), St. Louis, MO, USA, April 22-24, 2008.

Middleware and Software Engineering Track Program Committee Chair, 26<sup>th</sup> IEEE Real-Time System Symposium (RTSS '05), Miami, FL, USA, December 5-8, 2005.

Model-Driven Real-time and Embedded Systems Track Program Committee Chair, 11<sup>th</sup> IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS '05), San Francisco, CA, USA, March 7-10, 2005.

### **Journal Guest Editor**

Guest Co-Editor (with Ye-Qiong Song), Real-Time Systems 57(1-2), special issue on outstanding papers from the 27<sup>th</sup> International Conference on Real-Time Networks and Systems (RTNS 2019), April 2021.

Guest Co-Editor (with Oleg Sokolsky), Journal of Computer and System Sciences 73(2), special issue on Real-time and Embedded Systems (outstanding papers from RTAS 2005), March 2007, 241 pages.

### **Reviewer for Research Panels, Conference Program Committees, and Journals**

US National Science Foundation Panelist, Austrian Science Foundation external reviewer.

Technical program committee member for IEEE Real-Time Systems Symposium (RTSS), ACM SIGBED International Conference on Embedded Software (EMSOFT), IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS), Euromicro Conference on Real-Time Systems (ECRTS), IEEE International Conference on Embedded and Real-Time Computing Systems and Applications (RTCSA), Real-Time Networks and Systems (RTNS), International Conference on Distributed Computing Systems (ICDCS), International Conference on Middleware (Middleware), International Conference on Coordination Models and Languages (COORDINATION), IEEE International Symposium on Object/Component/Service-Oriented Real-Time Distributed Computing (ISORC), ACM SIGBED/SIGPLAN Conference on Languages, Compilers, and Tools for Embedded Systems (LCTES), IEEE International Conference on Pervasive Services (ICPS), ACM Symposium on Applied Computing (SAC).

Reviewer for Real-Time Systems, ACM Transactions on Embedded Computer Systems, IEEE Transactions on Parallel and Distributed Systems, and IEEE Transactions on Computers.

### **Department, School, and University Level Service**

|                |   |
|----------------|---|
| 2022 – present | Member, Washington University Student Sunrise Project Faculty Advisory Group                      |
| 2021 – present | Member, CSE Department Teaching Faculty Search Committee  |
| 2020 – present | Member of the Transdisciplinary Strategic Planning Committee, Brown School, Washington University |
| 2020 – present | Member of the PhD Programs Administrative Committee, Brown School, Washington University          |
| 2022 – 2023    | Member, Washington University Academic Integrity Outcomes Working Group                           |
| 2021 – 2022    | CSE Department Representative on McKelvey School of Engineering Academic Integrity Panels         |
| 2021           | Faculty Coordinator for CSE 591 Introduction to Graduate Study in CSE                             |

|                   |  |
|-------------------|--|
| 2019 – 2021       | Affiliated Faculty, Center for Innovation in Child Maltreatment Policy, Research and Training, Brown School, Washington University |
| 2009 – 2019       | CSE Department Masters Programs Director   |
| 2012 – 2019       | CSE Department Representative to the Engineering Graduate Board<br>(Chair of the board 2017-2019)                                  |
| 2013 – 2019       | CSE Faculty Program Advisor for Sever MISM, MCSM Programs  |
| 2017 – 2019       | Engineering School Masters Curriculum and Policy Committee<br>(Faculty Chair of the committee 2018-2019)                           |
| 2008 – 2018       | CSE Department Representative to Engineering IT Advisory Committee   |
| 2009 – 2014       | Affiliated Faculty and Advisory Board Member, Center for Violence and Injury Prevention, Brown School, Washington University       |
| 2011 – 2014       | Founding Chair, Advisory Council for Engineering School Professional Education Programs  |
| 2005, 2012 – 2014 | CSE Department Faculty Recruiting Committee<br>(Chair of the committee 2013-2014)  |
| 2009-2011         | CSE Department Leadership Committee  |
| 2009-2011         | Engineering School Graduate Engineering Task Force   |
| 2009-2010         | Engineering School Systems Engineering MS Program Task Force   |
| 2008-2009         | Speaker of the Engineering School Faculty Assembly   |
| 2001–2007         | Engineering School Representative to the School of Arts and Sciences.  |
| 2001–2005         | CSE Department Undergraduate Curriculum Committee.   |
| 2004              | CSE Department Graduate Recruiting Committee, Spring 2004.   |

## **Research Support**

### **Grants and Contracts Awarded as Principal Investigator**

- 2023 “Collaborative Research: CPS: Medium: Co-Designed Control and Scheduling Adaptation for Assured Cyber-Physical System Safety and Performance”, Christopher Gill PI, Sanjoy Baruah co-PI, NSF, 4/15/23-3/31/26, \$597,585 at WUSTL (+ \$592,020 to Purdue)
- 2013 “CPS Synergy: Collaborative Research: Safety-Feature Modeling and Adaptive Resource Management for Mixed-Criticality Cyber-Physical Systems”, Christopher Gill PI, Chenyang Lu co-PI, NSF, 10/1/13-9/30/17, \$398,305 at WUSTL (+ \$600,000 to UPenn)
- 2011 “CPS: Medium: Collaborative Research: CyberMech, a Novel Run-Time Substrate for Cyber-Mechanical Systems”, Christopher Gill PI, Kunal Agrawal and Chenyang Lu co-PIs, NSF, 9/1/11-8/31/15, \$919,987 at WUSTL including REU supplements (+ \$900,000 to Purdue U.)
- 2007 “CT-ISG: Collaborative Research: Non-bypassable Kernel Services for Execution Security”, Christopher Gill PI, William Smart co-PI, NSF, 8/1/07-7/31/10, \$232,000 at WUSTL (+ \$200,000 to U. Kansas)

- 2006 “Collaborative Research: CSR-EHS: Semantic Domain Integration for Embedded and Hybrid Systems”, NSF, 9/15/06-8/31/10, \$100,000 at WUSTL (+ \$100,000 to U. Kansas and \$100,000 to U. MO-Rolla )
- 2005 “CAREER: Time and Event Based System Software Construction” , NSF, 9/1/05-8/31/11, \$504,000 including REU and travel supplements
- 2003 “Embedded Information System Technology Support”, AFRL (subcontract from Boeing), 7/1/03 – 3/31/04, \$24,962
- 2003 “Distributed Scheduling Aspects for Time-Critical Targeting”, DARPA, 4/1/03 – 3/31/05, \$239,790 (plus \$ 957,496 in subcontracts to U. Rhode Island, U. Kansas, and Ohio U.)
- 2002 “Extension of Real-Time Middleware Capabilities for the Hi-Per-D Test-Bed via Enhancements to ACE and TAO Mechanisms and Services” , DARPA, 7/1/02 – 6/30/03 , \$42,087 (plus \$397,913 in a subcontract to OOMWorks)
- 2002 “CORBA Component Model for Real-Time Embedded Applications”, DARPA (subcontract from Boeing), 6/1/02 – 10/31/03, \$244, 695
- 2002 “Fault Tolerant, Latency Bounded CORBA Services” , DARPA (subcontract from Lockheed Martin), 3/2/02 – 12/31/03 , \$348,505
- 2002 “National Experimental Platform for Hybrid Embedded Systems Technology”, DARPA, (subcontract from Lockheed Martin), 2/1/02 – 6/30/03, \$28,000
- 2001 “NEST: Network of Embedded Systems” , DARPA (subcontract from Boeing), 8/6/01 – 5/31/05, \$278,458

### **Grants and Contracts Awarded as co-Principal Investigator**

- 2018 “CSR: Small: Dynamically Customizable Safety-Critical Embedded Systems”, Sanjoy Baruah PI, Christopher Gill co-PI, NSF, 9/2018-8/2021, \$484,697
- 2017 “CPS: Medium: Modular Power Orchestration at the Meso-scale”, Xuan (Silvia) Zhang PI, Christopher Gill co-PI, NSF, 9/15/17-8/31/21, \$936,504
- 2016 “Dynamic Real-time Virtualization and Cloud Computing”, Chenyang Lu PI, Christopher Gill co-PI, ONR, 1/1/16-12/31/18, \$610,330 at WUSTL (+ \$750k to UPenn)
- 2015 “NeTS: Medium: Provisioning, enforcing, and pricing temporal service differentiation in virtualized networked environments,” Roch Guerin, PI, Chris Gill and Chenyang Lu, co-PIs, NSF, 10/1/15-9/30/19, \$409,362
- 2015 “PAAS Messaging Middleware,” Chenyang Lu, PI, Roch Guerin and Chris Gill, co-PIs, Huawei, 11/1/15-10/31/16, \$192,104
- 2013 “XPS: FP: Real-Time Scheduling of Parallel Tasks”, Kunal Agrawal, PI, Christopher Gill and Chenyang Lu co-PIs, NSF, 9/1/13-8/31/17, \$749,950

- 2013 “Theory and Virtualization Platform for Compositional Real-Time Systems”, Chenyang Lu PI, Christopher Gill co-PI, ONR, 8/15/13-8/14/16, \$303,788 at WUSTL (+ \$455,822 to UPenn)
- 2013 “CSR: Workshop: Computing Clouds for Cyber Physical Systems (CC-4-CPS)”, Doug Schmidt (Vanderbilt) PI, Christopher Gill (WUSTL) and Jules White (VaTech) co-PIs, NSF, 9/15/12-12/31/13 (\$73,738 at Vanderbilt)
- 2011 “An Adaptive Property Aware HW/SW Framework for DDDAS”, Ron Cytron PI, Christopher Gill co-PI, AFOSR, 9/30/11-9/29/13, \$131,331 at WUSTL (+ \$168,656 to Iowa State U.)
- 2010 “EAGER: Collaborative Research: Seamless Integration of Conjoined Cyber-Physical System Properties”, Ron Cytron PI, Christopher Gill co-PI, NSF, 10/1/2010 - 9/30/2012, \$150,000 at WUSTL (+ \$150,000 to Iowa State U.)
- 2008 “CSR-DMSS, TM: A Substrate for Personalized Computing In the Real World”, Gruia-Catalin Roman PI through 6/30/2011, Christopher Gill co-PI through 6/30/2011 and PI 7/1/2011-08/31/2012, NSF, 09/01/2008 - 08/31/2012, \$359,504
- 2008 “MRI: Development of a Configurable Cyber-physical Instrument for Real-time Hybrid Testing”, Shirley Dyke PI, Christopher Gill and Chenyang Lu co-PIs, NSF, 7/1/08-6/30/11, \$516,000 (moved to Purdue 1/1/10, with sub-award back to WUSTL)
- 2007 “CPATH-T: Active Learning for Transformation of the Undergraduate Curriculum”, NSF Kenneth Goldman and Cindy Grimm PIs, Christopher Gill, Keith Sawyer, and Roger Chamberlain co-PIs, 8/1/07 – 7/31/11, \$578,987
- 2005 “Adaptive Systems for Collaboration in Multi-mode Mobile Environments”, NSF Gruia-Catalin Roman PI, Christopher Gill co-PI, 12/1/05 – 11/30/10, \$750,000
- 2003 “ARMS II: Aperiodic Scheduling End-to-End”, DARPA (subcontract from Lockheed Martin) Chenyang Lu PI, Christopher Gill co-PI, 10/1/03 – 5/31/06, Direct support: \$196,262

#### **Other Grants and Contracts Managed as Principal Investigator**

- 2002 “Design, Implementation, and Demonstration of a High-Performance Distributed Object Environment that Supports End-to-End Deterministic and Statistical QoS Guarantees,” DARPA, PI 4/11/02 – 6/30/02, \$296,962 at WUSTL (+ \$84,000 subcontract to University of California, Irvine)
- 2001 “Weapon Systems Open Architecture”, AFRL (subcontract from Boeing), PI 1/1/01-5/31/03, \$89,363
- 2001 “Adaptive Software Technology Demonstration Phase 2”, AFRL (subcontract from Boeing), PI 1/1/01-7/31/01, \$57,673