Short Curriculum Vitaé

Chita R. Das

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Department of Computer Science and Engineering
The Pennsylvania State University
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105 Atlee Cicle
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Education:

Center for Advanced Computer Studies, University of Louisiana, Louisiana
1986: Ph.D. in Computer Science

R.E.C. Rourkela, Sambalpur University, INDIA
1981: M.S. in Electrical Engineering

B.I.T. Sindri, Ranchi University, INDIA
1976: B.S. in Electronics and Communication

Experience:

The Pennsylvania State University (1997–present), Pennsylvania
Professor, Department of Computer Science and Engineering

The Pennsylvania State University (1992–1997), Pennsylvania
Associate Professor, Department of ECE and Computer Science and Engineering

The Pennsylvania State University (1986–1992), Pennsylvania
Assistant Professor, Department of Electrical and Computer Engineering

University of Louisiana (1983–1986), Louisiana
Research/Teaching Assistant, The Center for Advanced Computer Studies

Indian Institute of Technology (1981–1983), Kharagpur, India
Lecturer, Radar and Communication Center

Regional Engineering College (1976–1981), Rourkela, India
Lecturer, Department of Electrical Engineering

Research Interests:

Parallel & distributed computer architectures; network of workstations (NOWs)/clusters; communication networks & communication mechanisms; resource management (scheduling); QoS support in clusters and Internet; performance evaluation; fault-tolerant computing; mobile computing; multimedia systems.

Selected Journal Papers (out of 40+)

1. Das, C. R. and L. N. Bhuyan, "Bandwidth Availability of Multiple-Bus Multiprocessors," *IEEE Transactions on Computers*, Special Issue on Parallel Processing, pp. 918-926, October 1985.

2. Lin, W., T. L. Sheu, C. R. Das, T.-Y. Feng, and C. L. Wu, "A Conflict-Free Routing Scheme on Multistage Interconnection Networks," *IEEE Transactions on Computers*, 38(8):1086-1097, August 1989.

3. Das, C. R., J. T. Kreulen, M. J. Thazhuthaveetil, and L. N. Bhuyan, "Dependability Modeling for Multiprocessors," *IEEE Computer,* 23(10):7-19, October 1990.

4. Kim, J., C. R. Das, and W. Lin, "A Top-Down Processor Allocation Scheme for Hypercube Computers," *IEEE Transactions on Parallel and Distributed Systems*, 2(1):20-30, January 1991.

5. Das, C. R. and J. Kim, "A Unified Task-Based Dependability Model for Hypercube Computers," *IEEE Transactions on Parallel and Distributed Systems*, 3(3):312-324, May 1992.

6. Das, C. R., P. Mohapatra, L. Tien, and L. N. Bhuyan, "An Availability Model for MIN-Based Multiprocessors," *IEEE Transactions on Parallel and Distributed Systems*, pp. 1118-1129, October 1993.

7. Mohapatra, P., C. R. Das, and T.-Y. Feng, "Performance Analysis of Cluster-Based Multiprocessors," *IEEE Transactions on Computers*, 43(1):109-114, January 1994.

8. Yang, M. K. and C. R. Das, "A Parallel Branch-and-Bound Algorithm On a Class of Multiprocessors," *IEEE Transactions on Parallel and Distributed Systems*, 5(1):74-86, January 1994.

9. Kim, J. and C. R. Das, "Hypercube Communication Delay with Wormhole Routing," *IEEE Transactions on Computers*, 43(7):806-814, July 1994.

10. Yu, C. S. and C. R. Das, "Disjoint Task Allocation Algorithms for MIN Machines with Minimal Conflicts," *IEEE Transactions on Parallel and Distributed Systems*, 6(4):373-387, April 1995.

11. Mohapatra, P., C. Yu, and C. R. Das, "A Lazy Scheduling Scheme for Hypercube Computers," *Journal of Parallel and Distributed Computing*, 27(1):26-37, May 1995.

12. Mohapatra, P. and C. R. Das, "On Dependability Evaluation of Mesh Connected Systems," *IEEE Transactions on Computers*, 44(9):1073-1084, September 1995.

13. Sheu, T.-L., W. Lin, and C. R. Das, "Distributed Fault Diagnosis in Multistage Network-Based Multiprocessors," *IEEE Transactions on Computers*, 44(9):1085-1095, September 1995.

14. Mohapatra, P. and C. R. Das, "Performance Analysis of Finite-Buffered Asynchronous Multistage Interconnection Networks," *IEEE Transactions on Parallel and Distributed Systems*, 7(1):18-25, January 1996.

15. Mohapatra, P., C. Yu, and C. R. Das, "Allocation and Mapping Based Reliability Analysis of Multistage Interconnection Networks," *IEEE Transactions on Computers*, 45(5):600-606, May 1996.

16. Boura, Y. and C. R. Das, "Performance Analysis of Buffering Schemes in Wormhole Routers," *IEEE Transactions on Computers*, 46(6):687-694, June 1997.

17. Vaidya, A., C. R. Das, and A. Sivasubramaniam, "A Testbed for Evaluation of Fault-Tolerant Routing in Multiprocessor Interconnection Networks," *IEEE Transactions on Parallel and Distributed Systems*, Special Issue on Fault-tolerant Routing, 10(10):1052-1066, October 1999.

18. Kasbekar, M., C. Narayan, and C. R. Das, "Selective Checkpointing and Rollback in Multi-threaded Object-oriented Environment," *IEEE Transactions on Reliability*, selected as one of the four best papers from the 1999 Pacific-Rim Dependable Computing Symposium, 48(4):325-337, December 1999.

19. Vaidya, A., C. R. Das, and A. Sivasubramaniam, "Impact of Virtual Channel and Adaptive Routing on Application Performance," *IEEE Transactions on Parallel and Distributed Systems*, 12(2):223-237, February 2001.

20. Yoo. B. S. and C. R. Das, "A Fast and Efficient Allocation Scheme for Mesh-Connected Multicomputers," *IEEE Transactions on Computers*, 51(1):46-60, January 2002.

21. Yum, K. H., E. J. Kim, A. S. Vaidya, and C. R. Das, "MediaWorm: A QoS Capable Router Architecture for Clusters," *IEEE Transactions on Parallel and Distributed Systems*, Vol. 13, No. 12, pp. 1261-1274, December 2002.

22. Cao, G., L. Yin, and C. R. Das, "A Cooperative Cache Based Data Access Framework for Ad Hoc Networks", *IEEE Computer*, pp. 32-39, Feb. 2004.

23. Sarahan, N and C. R. Das, "Caching and Scheduling in NAD-Based Multimedia Servers", *IEEE Transactions on Parallel and Distributed Systems*, Vol. 15, No. 10, PP. 921-933, Oct. 2004.

24. Kim, E. J., K. H. Yum, G. M. Link, N. Vijayakrishnan, M. Kandemir, M. J. Irwin, and C. R. Das, " Energy Optimization Techniques in Cluster Interconnects," *IEEE Transactions on Computers, Special issue on Low-Power Design*, 2005.

25. Deng, X. S. Yi, G. Kesidis, and C. R. Das, " A Control Theoretic Analysis of Active Queue Management Schemes," to appear in it IEEE Transactions on Networking.

26. Kim, E. J., K. H. Yum, and C. R. Das, "Exploring IBA Design Space for Improved Performance," to appear in *IEEE Transactions on Parallel and Distributed Systems*.

27. Kim, J.H, G. S. Choi, and C. R. Das, "A SSL Backend Forwarding Scheme in Cluster-based Web servers," to appear in *IEEE Transactions on Parallel and Distributed Systems*.

Selected Refereed Conference Papers (Out of 130+)

1. Bhuyan, L. N. and C. R. Das, "Dependability Evaluation of Multicomputer Networks," *International Conference on Parallel Processing*, pp. 576-583, August 1986.

2. Das, C. R. and J. Kim, "An Analytical Model for Computing Hypercube Availability," *International Symposium on Fault-Tolerant Computing Systems*, pp. 530-537, June 1989.

3. Kim, J., C. R. Das, and W. Lin, "A Processor Allocation Scheme for Hypercube Computers," *International Conference on Parallel Processing*, (II), pp. 231-238. (Daniel L. Slotnick Award for the Most Original Paper), August 1989.

4. Das, C. R., L. Tien, and L. N. Bhuyan, "Availability Evaluation of MIN-Connected Multiprocessors Using Decomposition Technique," *International Symposium on Fault-Tolerant Computing Systems*, pp. 176-183, June 1990.

5. Kim, J. and C. R. Das, "Modeling Wormhole Routing in a Hypercube," *International Conference on Distributed Computing Systems*, pp. 386-393, May 1991. (Outstanding Paper Award).

6. Yang, M. K. and C. R. Das, "A Parallel Branch-and-Bound Algorithm for MIN-Based Multiprocessors," (poster paper) *ACM SIGMETRICS Conference on Measurements and Modeling of Computer Systems*, pp. 222-233, May 1991.

7. Kim, J. and C. R. Das, "On Subcube Dependability in a Hypercube," *ACM SIGMETRICS Conference on Measurements and Modeling of Computer Systems*, pp. 111-119, May 1991.

8. Algudady, M. S., C. R. Das, and M. J. Thazhuthaveetil, "Cache-Based Checkpointing Scheme for MIN-Based Multiprocessors," *International Conference on Parallel Processing*, pp. 497-500, August 1991.

9. Yu, C. S. and C. R. Das, "Multitasking in Multistage Interconnection Network Machines," *International Conference on Distributed Computing Systems*, pp. 30-37, June 1992.

10. Kim, J., K. G. Shin, and C. R. Das, "Performability Evaluation of Gracefully Degradable Hypercube Multicomputers," *Workshop on Fault-Tolerant Parallel and Distributed Systems*, pp. 140-147, July 1992.

11. Boura, Y. and C. R. Das, "A Class of Partially Adaptive Routing Algorithms for n-dimensional Meshes," *International Conference on Parallel Processing*, III, pp. 175-182, August 1993.

12. Boura, Y. M. and C. R. Das. "Efficient Fully Adaptive Wormhole Routing in n-Dimensional Meshes," *International Conference on Distributed Computing Systems*, pp. 589-596, June 1994.

13. Yu, C. and C. R. Das, "Limit Allocation: An Efficient Processor Management Scheme for Hypercubes," *International Conference on Parallel Processing*, II, pp. 143-150, August 1994.

14. Boura, Y. M. and C. R. Das, "Modeling Virtual Channel Flow Control in Hypercubes," *IEEE Symposium on High Performance Computer Architecture*(HPCA-1), pp. 166-175, January 1995.

15. Rahman, S. and C. R. Das, "Parallel Simulation of Mesh Routing Algorithms," *International Conference on Distributed Computing Systems*, pp. 158-165, May 1996.

16. Chodnekar, S., V. Srinivasan, A. Vaidya, A. Sivasubramaniam, and C. R. Das, "Towards a Communication Characterization Methodology for Parallel Applications," *IEEE Symposium on High Performance Computer Architecture*(HPCA-3), pp. 310-319, February 1997.

17. Kasbekar, M., C. Narayan, and C. R. Das, "Using Reflection for Checkpointing Objected Oriented Programs," *OOPSLA*, pp. 71-75, Vancouver, Canada, October 1998.

18. Vaidya, A., A. Sivasubramaniam, and C. R. Das, "LAPSES: A Recipe for High Performance Adaptive Router Design," *IEEE Symposium on High Performance Computer Architecture*(HPCA-5), pp. 236-243, Orlando, January 1999.

19. Nagar, S., A. Banerjee, A. Sivasubramaniam, and C. R. Das, "A Closer Look at Co-Scheduling Approaches for a Network of Workstations," Eleventh ACM Symposium on Parallel Algorithms and Architectures (SPAA), pp. 96-105, St. Malo, France, June 1999.

20. Kasbekar, M., S. Yajnik, R. Klemm, Y. Huang, and C. R. Das, "Issues in the Design of a Reflective Library for Checkpointing for C++ Objects," Symposium on Reliable Distributed Systems (SRDS), pp. 224-233, Lausanne, Switzerland, October 1999.

21. Yum, K. H., A. Vaidya, C. R. Das, and A. Sivasubramaniam, "Investigating QoS Support for Traffic Mixes with the MediaWorm Router," *IEEE Symposium on High Performance Computer Architecture* (HPCA-6), pp. 97-106, France, January 2000.

22. Kim, S., C. R. Das, and A. Sivasubramaniam, "Performance Analysis of A Buffer Management Technique for Interactive Video-on-Demand" International Conference on Multimedia Modeling (MMM'2000), Japan, November 2000.

23. Kasbekar, M. and C. R. Das, "Selective Checkpointing and Rollbacks in Multithreaded Distributed Systems," International Conference on Distributed Computing Systems (ICDCS), pp. 39-46, Arizona, April 2001.

24. Yum, K. H., E. J. Kim, and C. R. Das, "QoS Provisioning in Clusters: An Investigation of Router and NIC Design," Proc. *International Symposium on Computer Architecture*(ISCA), pp. 120-129, Sweden, June 2001.

25. Kim, E. J., K. H. Yum, and C. R. Das, "An Analytical Model for a QoS Capable Cluster Interconnect," Proc. *Inter. Conf. on Measurement, Modeling and Evaluation of Computer and Communication Systems* (MMB), pp. 9-24, Germany, September 2001.

26. Yum, K.H., E. J. Kim, G. Viswanathan, C. R. Das, M. Yousif and J. Duato, "Integrated Admission and Congestion Control for QoS Support in Clusters," Proc. of *IEEE Int. Conf. on Cluster Computing*, pp. 325-332, Chicago, September 2002.

27. Yi, S., X. Deng, G. Kesidis, and C. R. Das, "Providing fairness in the DiffServ Architecture" Proc. of *IEEE Globecom 2002*, pp. 1435-1439, Taipei, November 2002.

28. Deng, X. S. Yi, G. Kesidis, and C. R. Das, "Stabilized Virtual Buffer - An active Queue Management Scheme for Internet Quality of Service," Proc. of *IEEE Globecom 2002*, pp. 1628-1632, Taipei, November 2002.

29. Kim, E. J., K. H. Yum, N. Kim, C. R. Das, M. Yousif and J. Duato, "Performance Enhancement Techniques for InfiniBandTM Architecture," Proc. of *the 9th International Symposium on High-Performance Computer Architecture(HPCA-9)*, pp. 256-264, February 2003.

30. Sarhan, N. and C. R. Das, "An Integrated Resource Sharing Policy for Multimedia Storage Servers Based on Network-Attached Disks," Proc. of *the Twenty-Third International Conference on Distributed Computing Systems (ICDCS 2003)*, pp.136-143, Providence, RI, May 2003.

31. Lim, S., S-T. Park, W.-C. Lee, G. Gao, C. R. Das and C. L. Giles, "A Caching Mechanism for Improving Internet Based Mobile Ad Hoc Networks Performance," Proc. of *the 12th International World Wide Web Conference (WWW 2003)*, Budapest, Hungary, May 2003.

32. Kim, E. J., K.H. Yum, G. Link, N. Vijaykrishnan, M. Kandemir, M. Yousif, and M. J. Irwin and C. R. Das, "Energy Optimization Techniques in Cluster Interconnects," Proc. of *the International Symposium on Low Power Electronics and Design (ISLPED '03)*, August 2003.

33. Deng, X., S. Yi, G. Kesidis, and C. R. Das, "A Control Theoretic Approach for Designing Adaptive Active Queue Management Schemes," Proc. of *IEEE GlOBECOM'03*, San Francisco, CA, Dec. 2003.

34. Kim, J-H., G. S. Choi, D. Ersoz and C. R. Das, "Improving Response Time in Cluster-Based Web Servers through Coscheduling", Proc. of the *18th International Parallel & Distributed Processing Symposium* (IPDPS), April 2004.

35. Choi, G. S., J-H. Kim, D. Ersoz, A. Yoo and C. R. Das, "Coscheduling in Clusters: Is It a Viable Alternative?", Proc. of *Super Computing* (SC), November 2004.

36. Kim, J., D. Park, T. Theochar, N. Vijaykrishnan, and C. R. Das, "A Low Latency Router Supporting Adaptivity for On-Chip Interconnects," Proc. of the *42th Design Automation Conference* (DAC), Anaheim, California, June 2005.

37. Choi, G. S., J-H. Kim, D. Ersoz and C. R. Das, "A Multi-Threaded PIPELINED Web Server Architecture for SMP/SoC Machines," Proc. of 14th *International World Wide Web Conference*, (WWW), May 2005.

38. Kim, J-H., G. S. Choi and C. R. Das, "Improving Performance of Cluster-based Secure Application Servers with User-level Communication," Proc. of *International Conference on Data Engineering* (ICDE), Tokyo, April 2005.

39. Lim, S., C. Yu, C. R. Das, "Rcast: A Randomized Communication Scheme for Improving Energy Efficiency in MANETs," Proc. of the *25th International Conference on Distributed Computing systems* (ICDCS), Columbus, Ohio, June 2005.

40. Choi, G. S., J-H. Kim, D. Ersoz and C. R. Das, "Exploiting NIC Memory for Improving Cluster-Based Webserver Performance," Proc. of the *IEEE International Conference on Cluster Computing*, Boston, 2005.

41. Kim J-H., G. S. Choi and C. R. Das, "A Load Balancing Scheme for Cluster-based Secure Network Servers," Proc. of the *IEEE International Conference on Cluster Computing*, Boston, 2005.

42. Kim, J., D. Park, C. Nicopoulosr, N. Vijayakrishnan, and C. R. Das, "Design and Analysis of an NoC Architecture from Performance, Reliability and Energy Perspective," Proc. of the *1st Symposium on Architectures for Networking and Communications Systems (ANCS)*, Princeton, NJ, Oct. 2005.

43. Richardson, T. D., C. Nicopoulosr, D. Park, N. Vijayakrishnan, Y. Xie, and C. R. Das, "A Hybrid SoC Interconnect with Dynamic TDMA-Based Transaction-Less Buses and On-Chip Networks," Proc. of the *Proceedings of the VLSI Design* , 2006

44. Kim, J., D. Park, C. A. Nicopoulos, N. Vijaykrishnan, and C. R. Das, "Performance Enhancement through Early Release and Buffer Optimization in Network-on-Chip Router Architectures," in the special workshop on *Future Interconnects and Networks on Chip, at Design Automation and Test in Europe* (DATE 06).

45. Park, D., C. A. Nicopoulos, J. Kim, N. Vijaykrishnan, and C. R. Das, "Exploring Fault-Tolerant Network-on-Chip Architectures", *Proceedings of Dependable Systems and Networks* (DSN06), pp. 93-102, Philadelphia, 2006

46. Park, D., C. A. Nicopoulos, J. Kim, N. Vijaykrishnan, and C. R. Das, "A Distributed Multi-Point Network Interface for Low-Latency, Deadlock-Free On-Chip Interconnects", Proceedings of the *International Conference on Nano-Networks* (Nano-Net 2006), Lausanne, Switzerland.

47. Kim, J., C. A. Nicopoulos, D. Park , N. Vijaykrishnan, M. Yousif, and C. R. Das, "A Gracefully Degrading and Energy-Efficient Modular Router Architecture for On-Chip Networks", *Proceedings of the International Symposium on Computer Architecture* (ISCA06), pp. 4-15, Boston, 2006

48. Nicopoulos, C. A., D. Park, J. Kim, N. Vijaykrishnan, M. Yousif, and C. R. Das, "ViChar: A Dynamic Virtual Channel Regulator for Network-on-Chip Routers", to appear in the *Proceedings of the 39th International Symposium on Microarchitecture*, MICRO-39, December 2006.

Student Supervision:

Ph.D. Students : 26 (19 completed)

M.S. Students : 50+

B.S. (Honors Students): 15+

Recent Research Projects:

Scalable and Efficient Scheduling Techniques for Clusters. National Science Foundation, PI, 2001-2004, $254,883.

QoS Provisioning in InfiniBand Architecture (IBA) for System Area Networks. National Science Foundation, PI, 2002-2005, $331,964.

I^3C: An Infrastructure for Innovation in Information Computing. Research Infrastructure Grant, National Science Foundation, (with R. Acharya, C. L. Giles, M. J. Irwin, and P. E. Plassmann), PI, 2002-2007, $2,561,036 (includes $765,307 University matching).

Exploring Network-on-Chip (NoC) Architecture Design Space. National Science Foundation, PI, 2004-2007, $190,000.

Exploring Cluster-Based Data Center Design Space for High Performance and Dependability. National Science Foundation, PI, 2005-2008, $346,529.

purposeful Node Mobility for Mission-Oriented Sensor Networks. National Science Foundation, (with G. Cao, T. Laporta, and G. Kesidis), 2005-2008, $450,000.

Protecting TCP Congestion Control: Tools for Design, Analysis, and Emulation. National Science Foundation, Co-PI, (with G. Kesidis), 2005-2008, $350,000, total grant with Purdue University $675,000.

Impact of User-Level Communication on Data Center Performance, Intel Research, PI, 2005-2008, $195,000.

Honors and Awards:
Fellow of IEEE
Daniel L. Slotnick Award for the Best Original Paper.
A Processor Allocation Scheme for Hypercube Computers, *International Conference on Parallel Processing,* Aug. 1989.

IEEE Computer Society Outstanding Paper Award.
Modeling Wormhole Routing in a Hypercube, *International Conference on Distributed Computing Systems,* May 1991.

Best Paper Award.
Selective Checkpointing and Rollbacks in Multi-threaded Object-oriented Environment, *Pacific-Rim Dependable Computing (PRDC) Symposium,* December 1999.

Teaching Award.
Department of Computer Science and Engineering, 2001.

Selected Professional Activities:

Editorial and Technical Committee Activities:
Associate Editor, *IEEE Transactions on Computers*, 2001-2004
Associate Editor, *IEEE Transactions on Parallel and Distributed Systems*, 1994-1997
Chair, IEEE Technical Committee on Distributed Processing (TCDP), 2002-.
IEEE (CS) Fellow Selection Committee, 2002-.
Eidtor-in-Chief Seacrch Committee member, IEEE Transactions on Dependable and Secure Computing, 2003.
Chair, IEEE TPDS EIC evaluation Committee, 2002-2003.
Member, Advisory Board, *IEEE Technical Committee on Computer Architecture (TCCA)*, 1995-1998

Selected Program Committee Activities:
Program Chair, International Conference on High Performance Computer Architecture (HPCA), 2006.
General Co-Chair, *International Conference on Parallel Processing*, 1996
General Chair, *Euro-Par Workshop on Routing and Communication in Networks,* Passau, 1997
Program Chair, *6th International Conference on Advanced Computing* , India, 1998
Workshop Chair *International Conference on Parallel Processing*, 1998
Program Chair, *7th International Conference on Advanced Computing* , India, 1999
General Chair, *International Conference on Information Technology,*, India, December 2001
Program Committee Member of various international Conferences such as HPCA, SIGMETRICS, ICDCS, IPDPS, ICPP, ICS, FTCS, PRDC, MASCOT, ADCOM, and HiPC.
Session Chair, ICPP, ICDCS, FTCS, PRDC, HPCA