

# Vita

Nigamanth Sridhar

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## Research Interests

Software Engineering, Distributed Systems, Wireless Sensor Networks, Software Components, Programming Languages, Object-Oriented Systems, Formal Reasoning Methods, Concurrent Systems.

## Education

- **Ph.D. in Computer Science and Engineering** Mar 2004  
The Ohio State University, Columbus, OH, USA.  
*Dissertation: Dynamically Reconfigurable Parameterized Components.*  
*Advisors:* Prof. Paolo A. G. Sivilotti and Prof. Bruce W. Weide.
- **M.S. in Computer Science and Engineering** Jun 2000  
The Ohio State University, Columbus, OH, USA.
- **M.Sc. (Tech.) in Information Systems** May 1997  
Birla Institute of Technology and Science, India.

## Professional Experience

- **Assistant Professor** Aug 2004—present  
Department of Electrical and Computer Engineering, Cleveland State University, Cleveland OH, USA.
- **Post-doctoral Research Associate** Mar 2004—Jun 2004  
Department of Computer Science and Engineering, The Ohio State University, Columbus OH, USA.  
*Supervisor:* Prof. Anish Arora
- **Graduate Research Associate** Jan 1999—Mar 2004  
Department of Computer Science and Engineering, The Ohio State University, Columbus OH, USA.  
*Supervisors:* Prof. Paolo A. G. Sivilotti and Prof. Bruce W. Weide
- **Graduate Teaching Associate** Jan 1999—Mar 2004  
Department of Computer Science and Engineering, The Ohio State University, Columbus OH, USA.
- **Technical Intern** Jun 2000—Sep 2000  
Zeevo Corporation, Santa Clara CA, USA.
- **Member of Technical Staff** Jun 1997—Dec 1998  
Lucent Technologies Bell Labs, Columbus OH, USA
- **Technical Intern** Jan 1997—Jun 1997  
Lucent Technologies R&D India, Pune, India

## Published Papers

### Refereed Journal Publications

1. Nigamanth Sridhar. Serfs: Dynamically-bound parameterized components. *Journal of Systems and Software*, In press.
2. Jason O. Hallstrom, Nigamanth Sridhar, Paolo A.G. Sivilotti, Anish Arora, and William M. Leal. A container-based approach to object-oriented product lines. *Journal of Object Technology*, 3(4):161–175, April 2004.

### Refereed Conference Publications (Accepted on Full Peer-Review)

1. William P. McCartney and Nigamanth Sridhar. Abstractions for Safe Concurrent Programming in Networked Embedded Systems. In *Proceedings of the 4<sup>th</sup> ACM Symposium on Embedded Networked Sensor Systems (SenSys 2006)*, Boulder, CO, USA, November 2006. Pages 167–180.
2. William P. McCartney and Nigamanth Sridhar. TOSDev: A Rapid Development Environment for TinyOS. *Demo paper*. In *Proceedings of the 4<sup>th</sup> ACM Symposium on Embedded Networked Sensor Systems (SenSys 2006)*, Boulder, CO, USA, November 2006. Pages 387–388.
3. Andy R. Dalton, Jason O. Hallstrom, Hamza A. Zia, and Nigamanth Sridhar. Improving Network Link Quality in Embedded Wireless Systems. In *Proceedings of the 3<sup>rd</sup> Workshop on Dependable Embedded Systems*, Leeds, UK, October 2006. Pages 43–48.
4. Nigamanth Sridhar. Decentralized Local Failure Detection in Dynamic Distributed Systems. In *Proceedings of 25<sup>th</sup> Symposium on Reliable Distributed Systems (SRDS 2006)*, Leeds, UK, October 2006. Pages 143-152.
5. Nigamanth Sridhar, Jason O. Hallstrom, and Paolo A.G. Sivilotti. Container-based component deployment: A case study. In *Proceedings of the 18<sup>th</sup> International Conference on Software Engineering and Knowledge Engineering (SEKE 2006)*, San Francisco, CA, USA, July 2006.
6. Nigamanth Sridhar. Dynamic instantiation-checking components. In *Proceedings of the 21<sup>st</sup> Annual ACM Symposium on Applied Computing (SAC 2006)*, pages 1442–1446, Dijon, France, April 2006.
7. Nigamanth Sridhar and Jason O. Hallstrom. A behavioral model for software containers. In *Proceedings of FASE'06: Fundamental Approaches to Software Engineering*, pages 139–154, Vienna, Austria, March 2006.
8. Santosh Kumar, Bruce W. Weide, Paolo A.G. Sivilotti, Nigamanth Sridhar, Jason O. Hallstrom, and Scott M. Pike. Encapsulating concurrency as an approach to unification. In *FSE Workshop on Specification and Verification of Component-Based Systems*, pages 10–17, Newport Beach, CA, October 2004.
9. Nigamanth Sridhar and Bruce W. Weide. Reasoning about parameterized components with dynamic binding. In *Proceedings of the Workshop on Specification and Verification of Component-Based Systems*, pages 92–95, Helsinki, Finland, September 2003.
10. Nigamanth Sridhar, Scott M. Pike, and Bruce W. Weide. Dynamic module replacement in distributed protocols. In *Proceedings of the 23<sup>rd</sup> International Conference on Distributed Computing Systems*, pages 620–627, May 2003.
11. Nigamanth Sridhar and Jason O. Hallstrom. Generating configurable containers for component-based software. In *Proceedings of the Sixth Workshop on Component-Based Software Engineering*, Portland OR, May 2003.
12. Nigamanth Sridhar and Paolo A.G. Sivilotti. Lazy snapshots. In S.G. Akl and T.Gonzalez, editors, *Proceedings of the 14<sup>th</sup> IASTED International Conference on Parallel and Distributed Computing and Systems*, pages 96–101, Cambridge, MA, November 2002. IASTED, ACTA Press.

13. Jason O. Hallstrom, Scott M. Pike, and Nigamanth Sridhar. Iterators reconsidered. In *Proceedings of the Fifth Workshop on Component-Based Software Engineering*, Orlando, FL, May 2002.
14. Nigamanth Sridhar, Bruce W. Weide, and Paolo Bucci. Service facilities: Extending abstract factories to decouple advanced dependencies. In *Proceedings of the 7<sup>th</sup> International Conference on Software Reuse*, pages 309–326, April 2002.
15. Scott M. Pike and Nigamanth Sridhar. Early reply components: Concurrent execution with sequential reasoning. In *Proceedings of the 7<sup>th</sup> International Conference on Software Reuse*, pages 46–61, April 2002.
16. Scott M. Pike Paolo A.G. Sivilotti and Nigamanth Sridhar. A new distributed resource-allocation algorithm with optimal failure locality. In *Proceedings of the 12<sup>th</sup> IASTED Internation Conference on Parallel and Distributed Computing and Systems*, volume 2, pages 524–529. IASTED/ACTA Press, November 2000.

## Funding Record

1. Ohio Third Frontier Award: “Open Architecture Middleware for Sense-and-Respond Systems”. Part of the *Wright Center for Sensor Systems Engineering*. Co-PI (\$222,456; total award \$23.8 Million). 2007–2010.
2. Ohio ICE Research Award: “Predictable Monitoring for Networked Embedded Computing”, PI (\$24,062; total award \$44,552, partner: University of Akron). May 2006 - May 2007.
3. CSU Teaching Enhancement Award: “Advanced Embedded Systems”, Co-PI (\$5,000). November 2005.
4. CSU Technology Enhancement Award: “Software Engineering Educational Infrastructure”, Co-PI (\$51,467). September 2005.
5. Ohio Board of Regents Challenge Grant: “Engineering Component-Based Software”, PI (\$18,500). Aug 2005 – May 2006.

## M.S. Thesis Supervision

1. Dhvanish Chokshi. *A MAC Protocol with Need-Based Scheduling for Wireless Sensor Networks*, December 2005.
2. William P. McCartney. *Simplifying Concurrent Programming in Sensornets Using Threading*, May 2006.

## Conference and Workshop Presentations

1. **Decentralized Local Failure Detection in Dynamic Distributed Systems.**  
IEEE Symposium on Reliable Distributed Systems (SRDS 2006). Oct 2006.
2. **Dynamic Instantiation-Checking Components.**  
ACM Symposium on Applied Computing (SAC 2006). Apr 2006.
3. **A Behavioral Model for Software Containers.**  
Fundamental Approaches to Software Engineering (FASE 2006). Mar 2006.
4. **Local Failure Detection in Mobile Distributed Systems.**  
Northeast Ohio Networking Workshop (NEONet). Mar 2006.

5. **Reasoning About Parameterized Components with Dynamic Binding.**  
Workshop on Specification and Verification of Component-Based Systems at ESEC/FSE 2003. Sep 2003.
6. **Dynamic Module Replacement in Distributed Protocols.**  
The 23<sup>rd</sup> International Conference on Distributed Computing Systems (ICDCS 2003). May 2003.
7. **Generating Configurable Containers for Component-Based Software.**  
The 6<sup>th</sup> ICSE Workshop on Component-based Software Engineering (CBSE6). May 2003.
8. **Lazy Snapshots.**  
The 14<sup>th</sup> Annual Conference on Parallel and Distributed Computing Systems (PDCS 2002). Nov 2002.
9. **Service Facilities: Extending Abstract Factories to Decouple Advanced Dependencies.**  
The 7<sup>th</sup> International Conference on Software Reuse (ICSR7). Apr 2002.

## Invited Presentations

1. **Decentralized Dynamic Reconfiguration in Distributed Protocols.**  
Computer Science. Clemson University, Clemson SC, USA. Mar 2005.
2. **Service Facilities: Dynamically Reconfigurable Parameterized Components.**  
Tata Research, Design and Development Center (TRDDC), Pune, India. Aug 2003.
3. **Software Development for the .NET platform.**  
DBA Systems, Chennai, India. Aug 2003.

## Teaching Experience

At Cleveland State University, I have been involved in the development of a curriculum for the newly-established Master of Science in Software Engineering (MSSE) program. As part of this program, I have developed and taught the following new courses at the graduate level.

1. **Software Engineering.** Graduate course.  
This is an introductory course that introduces students to the field of Software Engineering and provides a bird's-eye view of a variety of topics that would be covered in other courses throughout the MSSE curriculum. This course is a pre-requisite for all other courses in the program; all students in the program are required to take this course.
2. **Software Systems Modeling.** Graduate course.  
This is a course that introduces students to formal specification and verification of software. Topics of study include specification of sequential as well as concurrent software. The focus is on light-weight techniques, and the implementation of these techniques. Several different specification notations are covered. The course also addresses issues of provably correct programs.
3. **Software Design and Architecture.** Graduate course.  
This course presents students with an in-depth look at software architecture and software construction, using several different current technologies such as design patterns, middleware, and frameworks. Practical approaches and methods for creating and analyzing software architecture are presented. The emphasis is on the interaction between quality attributes and software architecture. Software architecture reuse and software product lines are also discussed. Students also gain experiences with several case studies.
4. **Wireless Sensor Networks.** Graduate course. This course introduces some important software engineering issues and techniques associated with the development of reliable sensor networks. The course is centered around studies of sensor networks consisting of Berkeley motes, running applications

based on the TinyOS operating system, developed using the NesC programming language. This hardware/software platform is quickly becoming the de facto standard among researchers and practitioners. This course is available as an elective to all MSSE and MSEE students in the department.

## Awards

- **Travel Awards** for attending:
  - International Conference on Distributed Computing Systems (ICDCS) 2003.
  - International Conference on Software Engineering (ICSE) 2003.
- **Finalist for Best Paper Award** at the 14<sup>th</sup> Annual Conference on Parallel and Distributed Computing Systems (PDCS 2002).
- **Lucent Technologies Graduate Fellowship** (Mar—Dec 2001).
- **Lucent Technologies Trailblazer Award** for Team Excellence. 1998.
- **Merit award** from the Central Board of Secondary Education for being among the **top 0.1% of all students in India** in Mathematics and English. 1993.

## Professional Activities and Service

- *Program Committee Member.* International Conference on Distributed Computing Systems (ICDCS 2007).
- *Program Committee Member.* Ohio ICE Technical Conference (2006).
- *Program Committee Member.* Second IEEE PerCom Workshop on Pervasive Wireless Networking (PWN06).
- *Co-chair.* International Workshop on Global Software Development. Co-located with ICSE 2002. Orlando FL. May 2002.
- *Editor.* International Conference on Software Engineering (ICSE) newsletter, Window on the World (WOW). 2004.
- Member of the press team for the International Conference on Software Engineering (ICSE) newsletter, Window on the World (WOW). 2001, 2002, 2003.
- Referee for workshops, conferences, and journals.
  - 7th International Conference on Software Reuse (ICSR-7). 2002.
  - International Workshop on Global Software Development. 2002.
  - International Conference on Distributed Computing Systems (ICDCS). 2003.
  - Conference on Software Engineering Education and Training (CSEET). 2003.
  - International Workshop on Specification and Verification of Component-Based Systems (SAVCBS). 2003.
  - SRDS '03 Workshop on Dependable Embedded Systems (DES). 2003.
  - Journal of Empirical Software Engineering (EMSE). 2004.
  - ACM Transactions on Software Engineering and Methodology (TOSEM). 2005.
  - International Journal of Computers and Applications. 2005.
  - IEEE International Parallel & Distributed Processing Symposium (IPDPS). 2006.
  - Information Processing in Sensor Networks (IPSN) 2006.
  - 10th International Conference On Principles Of Distributed Systems (OPODIS 2006).
  - Elsevier Journal of Systems and Software. 2005–2005.

## Department and University Service

- Member of the Fenn College Strategic Planning Committee working on the *Vision 2010* for the College of Engineering, Cleveland State University. Jan 2006—present.
- Member of the Strategic Planning Committee to shape the *Vision 2010* for the Department of Electrical and Computer Engineering, Cleveland State University. Aug 2005—present.
- Member of the Graduate Program Committee for Software Engineering, Cleveland State University. May 2005—present.
- Faculty Secretary, Electrical and Computer Engineering, Cleveland State University. Sep 2004—present.
- Member of the Graduate Steering Committee, Computer and Information Science, OSU. Sep 2000—Aug 2003.
- Graduate representative to various departmental committees, Computer and Information Science, OSU. Sep 2000—Aug 2003.
  - Faculty Search Committee, 2002-03.
  - Awards Committee, 2001-02.
  - Graduate Studies Committee, 2001-02.
  - Graduate Admissions Committee, 2001-02.

## References

- **Dr. Paolo A.G. Sivilotti, Associate Professor;** 614.292.5835  
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695 Dreese Labs, 2015 Neil Ave, Columbus, OH 43210 USA  
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- **Dr. Neelam Soundarajan, Associate Professor;** 614.292.1444  
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- **Dr. Bruce W. Weide, Professor;** 614.292.1517  
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