

SUMANT UDAY TAMBE

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RESEARCH INTERESTS

- Middleware for end-to-end quality-of-service provisioning for distributed systems and platforms
- Domain-specific modeling and code generation using model-driven engineering
- Multi-paradigm design and implementation of software

EDUCATION

Vanderbilt University

Nashville, TN

Doctor of Philosophy, Computer Science

Aug 2005 – October 2010

- Dissertation: Model-driven Fault-tolerance Provisioning for Component-based Distributed Real-time Embedded Systems

New Mexico State University

Las Cruces, NM

Master of Science, Computer Science

Aug 2003 – Jul 2005

- GPA 3.9/4.0

University of Mumbai (K. J. Somaiya College of Engineering)

Mumbai, India

Bachelor of Engineering, Information Technology

Aug 1999 – Jul 2003

- Graduated with First Class Honors. Ratan Tata Scholar (top 6% of the university) in the junior year.
- Selected for senior-year research project on compiler optimization in **Indian Institute of Technology, Powai, Mumbai**

WORK EXPERIENCE

Vanderbilt University

Nashville, TN

Research Assistant

Aug 2005 – October 2010

- Invented and implemented protocols for fault-tolerance and fast (10 to 30 ms) recovery of CORBA server components. Developed CORBA services and code generators to reduce fault-tolerance and network configuration efforts upto 70%.
- Invented a multi-paradigm design approach for XPath-like succinct XML programming in C++. Designed and implemented an efficient, generic XML processing library in C++ (6K lines) that reduces traversal code size upto 87%.
- Published 7 peer-reviewed research papers on the above work in international systems and software conferences.

Telcordia Applied Research

Piscataway, NJ

Research Summer Intern

Jun 2009 – Aug 2009

- Experimented with Amazon Elastic Compute Cloud (EC2) and developed **Cloud-Launcher** Java infrastructure for automatic deployment and configuration of J2EE multi-tier applications in 4 different topologies.
- Investigated fault-tolerance modeling for automatic deployment planning of multi-tier J2EE applications.

Fisk University

Nashville, TN

Part-time Adjunct Faculty

Jan 2009 – May 2009

- Instructed a C++ programming course on object-oriented design, STL, exception-safety, and C++ idioms.
- Students rated the course as **excellent** in 11/12 metrics including subject matter expertise and clarity of communication.

Automated Trading Desk (a Citi company specializing in high-frequency trading)

Mount Pleasant, SC

Programming Intern

Jun 2007 – Aug 2007

- Joined the core infrastructure team and developed fault-tolerance extensions to a low-latency algorithmic trading system using C++, Adaptive Communication Environment (ACE), TCP/IP sockets, Berkeley DB embedded database, and Linux
- The company offered an immediate full-time position after the internship and invited for internships the following years.

New Mexico State University

Las Cruces, NM

Research Assistant

Jan 2004 – Jul 2005

- Developed an efficient C library for run-time analysis, reconfiguration, and evolution of Linux applications.

TECHNICAL SKILLS

- Languages/libraries: C/C++ (highly proficient), C++0x, STL, boost, Java, XPath, XML Schema, Python 2.6, SQL
- Development tools: Visual Studio 2008/2010, GNU g++ 4.5, XML data binding, Lex, Yacc, Bison, Berkeley DB
- Middleware: Adaptive Communication Environment (ACE), TCP/IP sockets with multi-threading, CORBA (TAO)
- Operating systems: Fedora Linux 12, Windows XP/7
- Model-driven software engineering and code generation: Generic Modeling Environment (GME 10)

SELECTED TECHNICAL ACCOMPLISHMENTS & HONORS

- The lead author of **More C++ Idioms** wikibook – an exhaustive catalog of C++ design patterns and best practices. Received rave reviews from **Prof. Bjarne Stroustrup** – the creator of C++ programming language.
- Blogging **C++ Truths** since 2005 – Reaches over 2100 readers with topics on modern C++ design.
- 1st place in an inter-collegiate (20 colleges) software project competition for implementing a language interpreter using C, Lex, and Yacc in Linux environment.
- National Talent Search (NTS) Scholar, India (1999, top 2% of the contestants)

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SELECTED PUBLICATIONS

1. **Sumant Tamba**, Aniruddha Gokhale, “Rectifying Orphan Components using Group-Failover in Distributed Real-time and Embedded Systems”, Submitted to *17th IEEE Real-time and Embedded Technology and Applications Symposium (RTAS 2011)*
2. **Sumant Tamba**, Akshay Dabholkar, Aniruddha Gokhale, “Fault-tolerance for Component-based Systems - An Automated Middleware Specialization Approach”, *International Symposium on Object/component/service-oriented Real-time distributed Computing (ISORC 2009)*
3. **Sumant Tamba**, Aniruddha Gokhale, “LEESA: Embedding Strategic and XPath-like Object Structure Traversals in C++”, *IFIP Working Conference on Domain Specific Languages (DSLWC 2009)*
4. **Sumant Tamba**, Akshay Dabholkar, Aniruddha Gokhale, “CQML: Aspect-oriented Modeling for Modularizing and Weaving QoS Concerns in Component-based Systems”, *16th Annual IEEE International Conference and Workshop on the Engineering of Computer Based Systems (ECBS 2009)*
5. **Sumant Tamba**, Jaiganesh Balasubramanian, Aniruddha Gokhale, Tom Domiano, “Model-Driven Dependability Provisioning in Enterprise Distributed Real-time and Embedded Systems”, *International Service Availability Symposium (ISAS 2007)*
6. **Sumant Tamba**, Aniruddha Gokhale, “Toward Native XML Processing Using Multi-paradigm Design in C++”, *Technical Report ISIS-10-105, Vanderbilt University, 2010*
7. Jaiganesh Balasubramanian, **Sumant Tamba**, Chenyang Lu, Aniruddha Gokhale, Christopher Gill, and Douglas C. Schmidt, “Adaptive Failover for Real-time Middleware with Passive Replication”, *15th IEEE Real-time and Embedded Technology and Applications Symposium (RTAS 2009)*
8. Jaiganesh Balasubramanian, **Sumant Tamba**, Aniruddha Gokhale, Douglas Schmidt, et al., “NetQoPE: A Model-driven Network QoS Provisioning Engine for Distributed Real-time and Embedded Systems”, *IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS 2008)*
9. James Hill, **Sumant Tamba**, Aniruddha Gokhale, “Model-Driven Engineering for Development-time QoS Validation of Component-based Software Systems”, *IEEE Engineering of Computer Based Systems Conference (ECBS 2007)*
10. Friedhelm Wolf, Jaiganesh Balasubramanian, **Sumant Tamba**, Aniruddha Gokhale, Douglas Schmidt, “Supporting Component-based Failover Units in Middleware for Distributed Real-time and Embedded Systems”, *Elsevier Journal of Software Architectures: Embedded Software Design, Special Issue on Embedded and Real-time Systems, 2010*
11. Naoman Abbas, **Sumant Tamba**, John Cook, “Using DDL to understand and modify Simple Scalar”, *Working Conference on Reverse Engineering, (WCRE 2004)*