

MAHESH BALKRISHNA CHAUDHARI

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Research Interests

Big Data; Enterprise Integration; Distributed Databases; Service Oriented Architecture; Incremental View Maintenance & Condition Monitoring over distributed heterogeneous data sources; Multiple Query Optimization; Events & Stream processing.

Teaching Interests

Database Systems, Query Languages, Object-Relational and Object-Oriented databases, Distributed databases, XML databases, Big Data Processing Systems.

Qualifications

- Successfully converted my Ph.D. proposal into a **3-year NSF funded research grant** [CSR # 0915325] to support my Ph.D. dissertation and two undergraduate students
- **Mentored undergraduate students** in database research and guided them to pursue graduate studies
- 3+ years of experience in **teaching undergraduate courses** and assisting professors in their classes as teaching assistant
- Certification of the 2-year **Preparing Future Faculty (PFF)** program
- Big data enthusiast with **15 years of industry and research experience** in designing and developing databases with **Relational and NoSQL data models**
- Hands-on experience in **architecting** and designing complex **data integration systems for disparate distributed heterogeneous data**
- Extensive experience in **big data** processing systems using **Spark, Hadoop, Hive** and other big data technologies.

Honors and Awards

- Won the **1st prize** in Zephyr's Second Annual Hackathon in 2016 for **solving the tough technical problems** of server-side map clustering and Tableau Integration with Zephyr Applications
- Won the **2nd prize** in Zephyr's First Annual Hackathon in 2015 for overall **innovative idea for inter-application communication**
- Won the **Graphies Award** for "**The Most Innovative Graph Application in Health Care**" at GraphConnect International Conference 2013
- **Awarded a 3-year National Science Foundation (NSF) research grant** to conduct innovative research in **multiple query optimization** and incrementally maintain **materialized views over heterogeneous data sources** in a distributed events and stream processing environment
- Awarded a 3-month NSF supplemental research grant to develop a **hybrid benchmark** with complex queries over relational and XML data sources
- Recognized as the **Preparing Future Faculty (PFF) Emeriti Fellow** for the academic year of 2009-2010 for **excellence in research, teaching & mentorship**

Education

- **Ph.D. in Computer Science and Engineering (GPA: 3.74)** 08/2004 – 05/2011
Arizona State University (ASU), Tempe, AZ
Dissertation: "Materialized Views over Heterogeneous Structured Data Sources in a Distributed Event Stream Processing Environment"
Committee Members: Dr. Suzanne W. Dietrich (**Chair**), Dr. Susan D. Urban, Dr. Hasan Davulcu, and Dr. Yi Chen
- **M.S. in Computer Science and Engineering (GPA: 3.81)** 08/2001 – 08/2003

Mississippi State University, Starkville, MS

Project: “Conversion of Legacy Genealogy Index into XML Database”

Committee Members: Dr. Edward Allen (**Chair**), Dr. Thomas Philip, and Dr. Lynne Mueller

- **Post Graduate Diploma in Advanced Computing (Grade: A)** 02/2001 – 07/2001
Centre for Development of Advanced Computing (C-DAC) Mumbai, India
Project: “Online Shopping Cart” using ASP and Oracle 8i
- **Bachelor of Engineering in Computer Engineering (62/100)** 06/1995 – 05/1999
University of Mumbai, Mumbai, India
Project: “Inventory Control Systems” using Visual Basic 6.0 and Oracle 8i
Project Supervisor: Assistant Professor Merly Thomas

Research Experience

- **Postdoctoral Research Associate** 06/2011 – 08/2012
[Supported by NSF Grant CSR #0915325]
Division of Mathematical and Natural Sciences, ASU, Phoenix, AZ
 - Designed the benchmark for evaluating the performance of a distributed environment containing heterogeneous data sources
 - Transformed the **relational TPC-H model** into a **hybrid database** containing relational & structured XML data sources
 - Modified the TPC-H data generator program in C to generate valid data for scale factors less than 1 GB
 - Implemented the hybrid database in **Oracle 11g, SQL Server and MySQL 5.5** with **varying scale factors**
 - **Optimized** and translated the **22 complex SQL queries into LINQ queries** to access the heterogeneous data sources
 - Benchmarked the queries over different sizes of the databases with and without caching and published the results in a referred journal
 - Enhanced the database curriculum at ASU to include the benchmarking theory and practical
 - **Mentored undergraduate students** in database research and guided them for higher education
 - Awarded a 3-month supplemental research proposal by NSF to explore the design and use of benchmarks in assessing the Distributed Event Stream Processing Environment and to introduce benchmarks in database curriculum
 - **Enhanced the CS2 course (ACO 102)** with the introduction to Java programming using **Android SDK** and provided hands-on experience in deploying the programs onto an android-based smartphone
- **Research Assistant [Supported by NSF Grant CSR #0915325]** 07/2009 – 05/2011
Division of Mathematical and Natural Sciences, ASU, Phoenix, AZ
 - Awarded a 3-year research grant by NSF to support Ph.D. dissertation and to support an undergraduate student [CSR #0915325, 08/2009-08/2012]. This grant is focused on investigating research issues related to **detecting common subexpressions for multiple query optimization** and defining and maintaining **hybrid materialized views over heterogeneous data sources** in a distributed event stream processing environment
 - Successfully developed a **distributed framework of autonomous agents** to communicate and exchange information using WCF and C#
 - Formalized a **mixed multigraph model** to represent heterogeneous query expressions over relational and XML data sources in a common graph for multiple query optimization using QuickGraph 3.6 and C#
 - Implemented a **heuristics-based algorithm** in C# to detect common subexpressions as the potential candidates for materialized views from the mixed multigraph model
 - Designed the algorithm to define and **incrementally maintain hybrid materialized views** over relational and XML data sources using Magic Sets optimization technique
 - **Mentored undergraduate students** in the upcoming areas of events and stream processing, **ORM, LINQ, XML** and database benchmarks
 - Guided an undergraduate student to develop “Object Manager” application that works with **object databases** stored either in the main memory or in **db4o**, an open source object database
- **Research Assistant [Partially supported by NSF Grant ITR #0312849]** 08/2004 – 08/2007
PRISM, Department of Computer Science and Engineering, ASU, Tempe, AZ

3D Face Authentication

- **Lead database developer** for designing a **large-scale object-relational database** to work in coordination with XML and binary data regarding 3D face scans in Oracle 10g
- Developed a web application using ASP.NET, C# and Oracle 10g for the demonstration of 3D face authentication and recognition project and the web application was recognized by **National Science Foundation (NSF)** as a “Nugget”
- The system was able to handle **2325 face scans from 1673 participants** of varying age groups and ethnicities for authentication and recognition purposes
- Analyzed the performance issues related to storing XML and binary data in relational databases and chose file pointers as an efficient way to handle the 3D face data files

Cumulus Photogrammetric, In-Situ and Doppler Observations (CuPIDO)

- Implemented a **graph plotting tool using VC++** for representing sounding data along with other geothermal parameters
- Developed programs for **volumetric visualization of cloud data** using Interactive Data Language (IDL) software on Mac OS X
- Successfully converted legacy Fortran programs into VC++ programs for calculating the sounding data and other thunderstorm clouds detection parameters

I³DEA and ATIC websites

- Designed a database framework to store information related to ATIC such as faculty, staff and students profiles, projects and publications details using MySQL
- Developed I³DEA and ATIC websites using ASP.NET and MySQL database

• **Research Assistant**

09/2001 – 08/2003

Mitchell Memorial Library, Mississippi State University, Starkville, MS

Genealogy XML Search Engine

- Designed and developed software for **automatic conversion and indexing** of Genealogical references from WordPerfect documents into an **XML database**
- Developed a **web-based search engine** in ASP 3.0 to retrieve records from this XML database efficiently using SAX, XPath and XSLT
- Presented the genealogy search engine at the Regional Genealogy Fair on June 14, 2003

Web-based Time Management System for work-study students

- Enhanced Web-based Time and Task management application (TimeClock) that manages time sheets for student workers to allow supervisors to assign and maintain tasks for the student workers and to allow students to enter and maintain their class schedule for each semester
- Created **report generation feature** for supervisors to report money that was spent per department per student, reports on tasks, and web-based project tracking and to provide project status reports to external/internal funding agencies

Other significant contributions to the University Library

- Analyzed and enhanced the efficiency of large databases at the library using **normalization techniques and query optimization**
- Developed an **integration framework** to collaborate library databases with university level databases especially for **authentication purposes using LDAP**
- **Transformed new ideas** into successful web-based database-driven projects such as “MSU Authors”, and “Books Order Online”

Teaching Experience

• **Instructor**

08/2011 – 05/2012

Division of Mathematical and Natural Sciences, ASU, Phoenix, AZ

08/2008 – 05/2009

Responsibilities:

- **Designed the course curriculum**, prepared instructional material and assignments
- Enhanced the course curriculum by introducing new topics:
 - Java programming using **Android SDK** for smartphones

- C# programming using Visual Studio 2008/Visual Studio 2010
- Used the **online assessment tool WileyPlus** for assigning the student with additional practice and assignments on Java programming

Courses:

- ACO 102: Principles of Computer Science (Spring 2012, Fall 2011, Spring 2009, Fall 2008)

- **Teaching Assistant**

08/2007 – 05/2009

Division of Mathematical and Natural Sciences, ASU, Phoenix, AZ

Responsibilities:

- Assisted professors in **enhancing the curriculum**, designing assignments and the associated rubrics, and the assessment of the assignments for the undergraduate courses
- Held office hours to **guide student learning** on assignments in a professional manner
- **Delivered lectures** to the students in the absence of the professors

Courses:

- ACO 100: Overview of Applied Computing (Fall 2007)
- ACO 101: Introduction to Computer Science (Spring 2009, Fall 2008, Spring 2008, Fall 2007)
- ACO 102: Principles of Computer Science (Spring 2008, Fall 2007)
- ACO 320: Database Systems and Transaction Processing (Fall 2007)
- ACO 420: Object Databases (Spring 2008)

Publications

Book Chapters

- Anshuman Razdan, Gerald Farin, Myung Soo-Bae and **Mahesh Chaudhari**, State of 3DFace Biometrics for Homeland Security Applications, Book chapter in *National Security (Part of the Elsevier Publishing Handbooks on Information Systems)*, Eds Hsinchun Chen, T. S. Raghu, Ram Ramesh, Ajay Vinze and Daniel Zeng, 26 April 2007, pp. 73-99.

Referred Journals

- **Mahesh B. Chaudhari**, Suzanne W. Dietrich, Jennifer Ortiz and Spencer Pearson, Towards A Hybrid Relational and XML Benchmark for Loosely-Coupled Distributed Data Sources, *Journal of Systems & Software*, 2015, pp. 78-87, DOI: <http://dx.doi.org/10.1016/j.jss.2015.07.029>.
- **Mahesh B. Chaudhari** and Suzanne W. Dietrich, Detecting Common Subexpressions for Multiple Query Optimization over Loosely-Coupled Heterogeneous Data Sources, *Journal of Distributed and Parallel Databases*, Springer Publications, December 2014, pp. 1-27, DOI: <http://dx.doi.org/10.1007/s10619-014-7166-6>.

Referred Conference Proceedings

- Jennifer Ortiz, Suzanne W. Dietrich and **Mahesh B. Chaudhari**, Learning from Database Performance Benchmarks, *Journal of Computing Sciences in Colleges*, 27, 4 (Apr. 2012), 151-158 (In Proceedings of Consortium for Computing Sciences in Colleges, Southwestern Region, Stockton, CA, March 2012).
- Suzanne W. Dietrich and **Mahesh Chaudhari**, LINQ ROX! Integrating LINQ into the Database Curriculum, In *Proceedings of ACM SIGCSE International Conference on Computer Science Education*, Dallas, Texas, March 2011, pp. 293-298.
- **Mahesh B. Chaudhari**, A Distributed Event Stream Processing Framework for Materialized Views over Heterogeneous Data Sources, *VLDB 2010 Ph.D. Workshop*, Singapore, September 13-17, 2010.
- **Mahesh B. Chaudhari** and Suzanne W. Dietrich, Metadata Services for Distributed Event Stream Processing Agents, In *the 19th International Conference on Software Engineering and Data Engineering (SEDE2010)*, San Francisco, June 16-18, 2010, pp. 307-312.
- Suzanne W. Dietrich and **Mahesh Chaudhari**, The LINQ between XML and databases: a gentle introduction, *Journal of Computing Sciences in Colleges*, 25, 4 (Apr. 2010), 158-164 (In Proceedings of Consortium for Computing Sciences in Colleges, Southwestern Region, Thousand Oaks, CA, March 2010).
- Suzanne W. Dietrich and **Mahesh Chaudhari**, The Missing LINQ between Databases and Object-Oriented Programming Languages: LINQ as an Object Query Language for a Database Course, *Journal of Computing Sciences in Colleges*, 24, 4 (Apr. 2009), 282-288 (In Proceedings of Consortium for Computing Sciences in Colleges, Southwestern Region, San Diego, CA, April 2009).

Industry Conference Presentations

- **Mahesh B. Chaudhari**, Integrating Diverse Healthcare Data using MongoDB and Neo4j, at GraphConnect, San Francisco, CA, October 21, 2015.
- **Mahesh B. Chaudhari**, Ontology-driven modeling of healthcare data using a graph database, at the Stanford Medicine X Conference, September 26, 2015.
- **Mahesh B. Chaudhari**, Modeling Ontology-Driven Healthcare Data over NoSQL Solutions, at the Fifth Annual NoSQL Now! Conference, San Jose, California, USA, August 18, 2015.
- **Mahesh B. Chaudhari**, Designing an adaptive ontology-driven model for Healthcare data in MongoDB, at the 2nd Annual Global Big Data Conference, Santa Clara, California, USA, September 10, 2014.
- **Mahesh B. Chaudhari**, Avoiding Deadlocks in Neo4j on Zephyr Analytics Platform, at the Fourth Annual NoSQL Now! Conference, San Jose, California, USA, August 12, 2014.
- **Mahesh B. Chaudhari**, Case Study: Avoiding Deadlocks and Other Lessons Learned in Graph Database Implementation at Zephyr Health, TDWI Solution Summit: Delivering Business Value from Big Data Analytics, Savannah, GA, USA, March 21, 2014.
- **Mahesh B. Chaudhari**, Avoiding Deadlocks in Neo4j on Z-Platform, at GraphConnect, San Francisco, California, USA, October 12, 2013.

Manuscripts

- **Mahesh B. Chaudhari** and Suzanne W. Dietrich, Maintaining Materialized Views over Loosely-Coupled Distributed Heterogeneous Data Sources, *manuscript submitted and under review at a referred journal*, 2017.

Poster Presentation

- **Mahesh B. Chaudhari**, Combining Teaching, Research, Learning & Service, *at the Preparing Future Faculty Capstone Fair*, April 24, 2009.

Professional Experience

- **Principal Software Engineer** 05-2016 - Present
Neustar Inc., San Francisco, CA 94105
 - Lead design engineer for **Data Science Development Kit (DSDK)** to provide fully tagged and unified digital advertising data to customers for their personalized data analytics.
 - Improved the performance of the DSDK process by **75% by optimizing** the code used in the extract process.
 - Designed the next generation cost effective DSDK process using **Spark, Spark streaming** with **EMR Clusters, S3**.
 - This spark-based data pipeline has saved approximately \$21000 per month and helped in **processing terabytes of data** every day in 3-4 hours period.
 - Designed and delivered new features like **pull-based data model, cross-region, cross-account S3-S3 sync, cross account IAM role based access**.
 - **Managing** a highly motivated **international team** for timely delivery of new features for the product.
 - Deep understanding of **distributed data processing pipelines** over **Redshift, Spark, and Hadoop** infrastructures.
- **Software Architect** 09/2014 – 04-2016
Zephyr Health, San Francisco, CA 94105
 - Successfully designed and deployed **complex sales analytics** product fetching **multi-million dollar contracts**
 - Skillfully architected, designed and built the next generation data integration platform using **MongoDB and Neo4j**
 - Designed **Ontology-driven domain Models** for **Disparate and heterogeneous Pharmaceutical data**
 - Guided data engineering team to build an **event-based Apache Kafka system** to **stream incremental data** to the domain models
 - Working on performance improvement using state of the art **non-relational data modeling** and **query design** for enterprise-level multi-tier architecture
 - Migrated the company's infrastructure from silo multi-client architecture to a **full-stack multi-tenant architecture**
 - Guided the dev-ops team on building automation-based infrastructure for **scalable software deployment** using Bamboo, Stash, bash scripts
- **Senior Software Engineer** 09/2012 – 08/2014

Zephyr Health, San Francisco, CA 94105

- Designed and implemented **NoSQL** and **Graph-based** database systems for **Big Data Analytics and visualization**
- Provided **continuous integration** solutions for next generation platform for pharmaceutical and healthcare data
- Defined **automated jobs** for successful deployment of multiple **MongoDB and Neo4j** data servers for **high-availability** on **Amazon EC2** Cloud services
- Well adapted to **Scrum/Agile** software development framework using latest tools such as **Jira, Stash, Jenkins**
- **Software Engineer** 09/2003 – 06/2004
Department of Plant and Soil Sciences, Mississippi State University, Starkville, MS
 - Conducted analysis for optimal performance of the **Real-time data acquisition and control system** (SPAR) to process **streaming sensor data** over 180 incoming channels
 - **Re-architected** the data acquisition and control system using Visual Basic 6.0 to communicate over six new HP Agilent 34970A data acquisition/switch units for processing **incoming streams on 180 channels and outgoing streams on 300 channels** within a time frame of **10 seconds**
 - Developed **graph-based reporting software** in Visual Basic 6.0 for analyzing the collected data at real-time
- **Software Engineer** 07/1999 – 02/2001
Indian Institute of Technology (IIT), Mumbai, India
 - Conducted a **detailed requirements analysis** for Illustrated Parts Catalogue (IPC) project designed for automating aircraft spare parts maintenance
 - Developed the **multimedia-based object-relational database** in Oracle 8.0 to maintain information about different parts of the aircraft in various formats such as text, jpeg, audio, VRML and animation
 - Was an integral part of the project team to deliver the developed software to Aeronautical Development Agency, Bangalore
 - **Integrated** the IPC project with Aircraft Systems Maintenance Simulator (ASMS) project so that the ASMS project can retrieve information from the common object-relational database for simulation purpose

Technical Skills

- **Database Systems** : MongoDB, Neo4j, MySQL 5.6, PostgreSQL 4.2, Redshift, Hive, MS SQL, Oracle 11g, MS Access 2007
- **XML Technologies** : XML, XPath, XSLT, SAX, DOM
- **Query Languages** : SQL, Cypher, LINQ, XQuery, NoSQL, Hive-QL
- **Programming Languages** : C#, Java, C/C++
- **Technologies** : Kafka Event Framework, Map Reduce, Spark, Spark Streaming, AWS Console, AWS Command Line Interface, Sybase Complex Event Stream Processor, Windows Communication Foundation (WCF), Oracle BPEL Process Manager, Android SDK, QuickGraph 3.6
- **Web Development** : ASP.NET 3.5, PHP5, HTML, CSS, Groovy and Grails
- **Operating Systems** : Mac OS X, Ubuntu, Windows 7, Windows Vista, Windows XP
- **Development Tools** : Microsoft Visual Studio, NetBeans, Eclipse, IntelliJ
- **Agile Technologies** : Stash, Git, Sourcetree, Jenkins, Bamboo, Scrum

Invited Talks (Guest Lectures)

- “Minimal Functional Dependencies and Synthesis”, ACO 320: Database Systems and Transaction Processing, Arizona State University, 11/29/2011
- “Dependency Preservation and Normal Forms”, ACO 320: Database Systems and Transaction Processing, Arizona State University, 10/27/2009
- “Recursion in Java”, ACO 102: Principles of Computer Science, Arizona State University, 10/27/2009
- “Overview of Object Manager and DB4O Open source OODB”, ACO 420: Object Databases, Arizona State University, 03/25/2008
- “Programming web-based application with ASP.NET (C#) and SQL Server 2005”, ACO 320: Database Systems and Transaction Processing, Arizona State University, 10/11/2007
- “Tools for memory: Semantic content (XML)”, CPI 101: Introduction to Informatics, Arizona State University,

Conference Referee

- ACM's Special Interest Group on Computer Science Education (**SIGCSE**): 2010-2016
- ACM's Innovation and Technology in Computer Science Education (**ITiCSE**): 2011, 2013
- Consortium for Computing Sciences in Colleges (**CCSC**): 2009-2011, 2013
- Graduate and Professional Student Association (**GPSA**) at Arizona State University: Jumpstart Research Grant 2010, Graduate Research Support Program 2009

Grants

- Received Travel Grant from Graduate College at Arizona State University for presenting the paper at VLDB 2010 - 36th International Conference on Very Large Data Bases (\$350)
- Received Travel Grant from Graduate and Professional Student Association (GPSA) at Arizona State University for presenting the paper at VLDB 2010 - 36th International Conference on Very Large Data Bases (\$300)
- Recognized as the PFF Emeriti Fellow for the academic year of 2009-2010 (\$1000)
- Received Travel Grant from PFF for presenting the paper at the Second Annual Consortium for Computing Sciences in Colleges Southwestern Regional Conference (\$300)
- Selected as 1 of the 80 students for the competitive Preparing Future Faculty (PFF) program at Arizona State University

Grant Writing Activities

- **Supplement: Materialized Views over Heterogeneous Structured Data Sources in a Distributed Event Stream Processing Environment** – NSF 2011
 - **Investigator:** Suzanne W. Dietrich
 - **Institution:** Arizona State University
 - **Contributions:** Lead author on the proposal
 - **Status:** Funded (05/2012 – 07/2012)
- **Preparing Future Faculty (PFF) Emeriti Fellowship** – Preparing Future Faculty 2009
 - **Investigator:** Mahesh Chaudhari
 - **Institution:** Arizona State University
 - **Contributions:** Lead author on the proposal
 - **Status:** Funded (08/2009 – 05/2010)
- **Materialized Views over Heterogeneous Structured Data Sources in a Distributed Event Stream Processing Environment** – NSF 2008 ([Link](#))
 - **Investigators:** Suzanne W. Dietrich
 - **Institution:** Arizona State University
 - **Contributions:** Lead author on the proposal
 - **Status:** Funded (08/2009-08/2012)
- **Specification, Semantics, and Optimization of Context Filters for Distributed Event Stream Processing** – NSF 2007
 - **Investigators:** Susan D. Urban, Suzanne W. Dietrich, Yi Chen
 - **Institution:** Arizona State University
 - **Contributions:** Lead prototype developer on the proposal with significant section writing
 - **Status:** Not Funded
- **An XML Framework for Integrating Continuous Queries, Composite Event Detection, and Database Condition Monitoring for Multiple Data Streams** – NSF 2006
 - **Investigators:** Susan D. Urban, Suzanne W. Dietrich, Yi Chen
 - **Institution:** Arizona State University
 - **Contributions:** Lead prototype developer on the proposal with significant section writing
 - **Status:** Not Funded

Professional Development

Successfully completed the 2-year Preparing Future Faculty (PFF) program at Arizona State University. Preparing Future Faculty (PFF) is a nationally recognized professional development program for doctoral and MFA students, as well as postdocs, interested in pursuing a faculty position upon graduation.

Activities:

- Understanding and implementing strategies and techniques for effective teaching and classroom assessment
- Preparing for first academic job, balancing life and academia, and understanding promotion and tenure
- Attended seminars on CV writing, Grant writing, and Diversity in academia
- Created Professional Portfolio for Probationary Review/Promotion and Tenure Packet, and Individualized Self-Development Plan
- Participated in organizing interactive discussion groups, and mock interviews

Workshops:

- Preparing a Teaching Portfolio, School of Applied Arts and Sciences, 02/01/2008
- Creating Rubrics for Easier Grading, Center for Learning and Teaching Excellence, 10/02/2007
- Library Training for Research Assistants (Advanced), Center for Learning and Teaching Excellence, 09/28/2007
- Classroom Assessment Techniques, Center for Learning and Teaching Excellence, 09/21/2007
- Workshops on Blackboard, Applied Learning Technologies Institute, 7/17/2008, 7/16/2008, 09/14/2007

Professional Memberships

- Member of The Upsilon Pi Epsilon Honorary Society
- Member of Association for Computing Machinery (ACM)
- Member of Institute of Electrical and Electronics Engineers (IEEE)

Service

Department

Participated in the following events as an exhibitor.

- School of Computing and Informatics Opening 2006: held on September 29, 2006 at Brickyard, Arizona State University, Tempe Arizona
- SIAM Conference on Geometric Design and Computing 2005: held on October 31 - November 3, 2005 in Phoenix, Arizona
- Decision Theatre Opening 2005: held on May 23 2005 at Arizona State University, Tempe Arizona

Institutional

Participated in the following events as an exhibitor.

- 10th Anniversary Celebration of Arizona State University Polytechnic Campus: held on November 03, 2006 at Arizona State University, Polytechnic Campus
- Homecoming Event 2006: held on October 21, 2006 at Arizona State University, Tempe Arizona
- Homecoming Event 2005: held on October 28, 29, 2005 at Arizona State University, Tempe Arizona
- ASU Technology Expo 2005: held on September 28, 2005 at Arizona State University, Tempe Arizona
- Homecoming Event 2004: held on November 2004 at Arizona State University, Tempe Arizona

Community

Participated in the following events as an exhibitor.

- "SEE ASU" Event 2006 for school kids: held on March 23 and 24, 2006 at Arizona State University, Tempe Arizona
- Intel International Science and Engineering Fair 2005: held on May 8-14 2005 at Phoenix, Arizona

References

- Dr. Suzanne W. Dietrich, Professor, Division of Mathematical and Natural Sciences, Arizona State University, P O BOX 37100, Phoenix, AZ 85609-7100; (602) 543-5628; dietrich@asu.edu
- Dr. Susan D. Urban, Professor Emeritus, Department of Computer Science and Engineering, Arizona State University; susan.urban@asu.edu
- Dr. Roger Berger, Professor Emeritus, Division of Mathematical and Natural Sciences, Arizona State University, P O BOX 37100, Phoenix, AZ 85609-7100; (602) 256-9457 roger.berger@asu.edu