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Research Interests

My core research interests are centered largely around the two stand out aspects of Web 2.0, which are: 1) Web as a platform and 2) Harnessing collective intelligence. My dissertation is in the area of specification, search, distribution and integration of services. In my thesis, I investigate various approaches that leverage on semantic Web techniques for designing software for the Web (such as mashups) as well as human-centric software (such as human computation applications) over social networks. My thesis contributions include: a) microformats for services specification, b) faceted API search, c) service integration, including smart mashups, dynamic configuration and data mediation, and d) application distribution over the social network platforms.

Education

Wright State University (Relocated in Jan 2007)

Dayton, OH

Ph.D. Computer Science and Engineering; Current GPA:4.0

Jan 2007-2009 (Expected)

- **Ph.D Dissertation:** Design and Distribution of Software in the Web 2.0 and Social networks Era (*Working title*).

University of Georgia

Athens, GA

Ph.D. Computer Science; Graduating GPA:4.0

Aug 2004- Dec 2006

- Relevant Courses: Semantic Web, Distributed Systems, Computer Networks, Software Engineering, Algorithms, Advanced Databases, Advanced Information Systems, Programming Languages

Sri Satya Sai Institute of Higher Learning

India

Masters in Mathematics and Computer Science; Graduating GPA:4.45 out of 5.00 Jun 1999- Mar 2001

- Masters Thesis: Pass the Buck: A Preventive Approach to Congestion Control in ATM Networks
- Relevant Courses: Algebraic Topology, Operating Systems, Computer Networks, Compiler Design, Databases, Systems Programming

Sri Satya Sai Institute of Higher Learning

India

Bachelors in Mathematics and Computer Science; Graduating GPA:4.23 out of 5.00 Jun 1996- Mar 1999

- Relevant Courses: Advanced Real Analysis, Graph Theory, Topology, Ordinary and Partial Differential Equations, Vector Algebra

Research Experience

Research Assistant and Student Coordinator

Services Research Lab

kno.e.sis center

Jan 2007-Present

- Investigated the role of semantic computing techniques in the specification, integration, execution and distribution of services and applications in Web and mobile environments.
- Published 6 peer-reviewed conference and journal papers and 4 invited papers, including two papers in ICWS, one of the top conferences in the area of Services computing with an acceptance rate of 16%.
- Contributed to open source reference implementation for the SAWSDL W3C standard
- Contributed as a volunteer to the IBM Sharable Code project

Research Assistant

METEOR-S

LSDIS Lab, University of Georgia

Aug 2004-Dec 2006

- Investigated the role of Semantic Web Services in enabling dynamic configuration and adaptation of Web processes.
- Published 4 peer-reviewed conference, workshop and journal papers and two invited papers, including one paper in ICSOC and two papers in ICWS (top two conferences in the area of services computing)

Professional Experience

Summer Research Intern

IBM India Research Labs, Bangalore, India

May 2007 - Sep 2007

- Developed an approach to increase component reusability in business process design and development, using model comparison techniques.
- The algorithm was demonstrated as a Rational plugin.

Summer Research Intern

IBM T.J.Watson Research Center, Hawthorne, NY

Advanced Delivery Platforms Group

May 2006 - Sep 2006

- Developed a three tier model to integrate a business process specification, its active instances and the middleware infrastructure.
- The algorithm was implemented as a “mashup” using Google Maps to demonstrate the integration over distributed middleware.

Visiting Researcher

National University of Ireland, Galway

Digital Enterprise Research Institute

Oct 2005 - Dec 2005

- Initiated the effort to integrate the WSMO and WSDL-S frameworks. Designed a framework to incorporate WSDL-S annotations using WSMO ontologies.

Summer Research Intern

IBM T.J.Watson Research Center, Hawthorne, NY

Component Systems Group

May 2004 - Sep 2004

- Implemented the code generation and design framework for Next Generation SOA Middleware.

Software Solutions Analyst

Chennai, India

Photon Infotech Private Limited

May 2001 - Aug 2002

- Led the development effort of automatically porting legacy databases in Fourth Dimension to MS SQL in a distributed database environment.
- Led a team of three in designing and prototyping a Web based query broker. Created an application development framework in Macromedia Flash for writing instructional tutorials.

Grant Proposals

I have contributed extensively to the grant proposals listed below during my Ph.D. In addition to actively participating in the writing process, the results from my research have been used in funded proposals.

- [1] Significantly contributed to the successful IBM Eclipse Innovation Grant (2004). The proposal discussed applications on top of the Eclipse platform to enable semantic annotation of Web services.
- [2] Initiated research and contributed to the writing of successful NSF extension grant (2005). The proposal discussed an approach for process computation using graph based semantic Web operators.
- [3] Significant contribution to Semantics Enabled Networking Systems. Submitted to CISCO (2005). The proposal discussed a middleware framework for semantic annotation of high throughput data.
- [4] Significant contribution to network aware middleware for semantic Web data management. Submitted to NSF (2006). The proposal discussed a large scale distributed semantic middleware for managing large semantic models in RDF.

- [5] Significant contribution to NSF proposal on autonomic Web processes with applications to healthcare (2007). The proposal applied my previous work in the area of semantic Web services to healthcare management.
- [6] The results of my work in the METEOR-S project were used in the successfully funded NIH grant (Semantics and services enabled problem solving environment for Tcruzi) (2008). The objective of this proposal is to create an ontology driven problem solving environment for data integration.
- [7] Significantly contributed to the NSF proposal on citizen sensor Web and social computing. The proposal is under review (2009). In this proposal, we put forth research ideas for analyzing and integrating user generated real time data, using spatio-temporal and thematic semantic models.
- [8] Initiated research in the area of citizen sensor Web and social computing that led to funding from the Air Force Research Laboratory (2009).

Publications

Peer Reviewed Conference and Workshops

- [1] **Karthik Gomadam**, Ajith Ranabahu, Meenakshi Nagarajan, Kunal Verma and Amit P. Sheth, A Faceted Classification Based Approach to Search and Rank Web APIs, Proceedings of the Sixth International Conference on Web Services, 2008, Beijing, China. *pp: 177-184 (Acceptance Rate: 16%)*.
- [2] Jacek Kopecky, **Karthik Gomadam**, Tomas Vitvar, hRESTS: HTML Microformat for Describing RESTful Web Services and APIs, Proceedings of the 2008 IEEE/WIC/ACM International Conference on Web Intelligence, 2008, Brisbane, Australia. *pp: 619-625 (Acceptance Rate: 19%)*.
- [3] **Karthik Gomadam**, Ajith Ranabahu, Lakshmish Ramaswamy, Kunal Verma and Amit P. Sheth, Mediatability: Estimating the Degree of Human Involvement in XML Schema Mediation, Proceedings of the Second International Conference on Semantic Computing, 2008, Santa Clara, CA. *pp: 394-401*.
- [4] **Karthik Gomadam**, Ajith Ranabahu, Lakshmish Ramaswamy, Kunal Verma and Amit P. Sheth, A Semantic Framework for Identifying Events in a Service Oriented Architecture, Proceedings of the Fifth International Conference on Web Services, 2007, Salt Lake City, UT. *pp: 545-552 (Acceptance Rate: 16%)*.
- [5] Zixin Wu, **Karthik Gomadam**, Ajith Ranabahu, Amit P. Sheth, and John A. Miller, Automatic Composition of Semantic Web Services using Process Mediation, Proceedings of the 9th International Conference on Enterprise Information Systems, 2007, Funchal, Portugal. *pp: 453-461*.
- [6] Nanjangud C. Narendra, Karthikeyan Ponnalagu, **Karthik Gomadam**, Amit P. Sheth: Variation Oriented Service Composition and Adaptation (VOSCA): A Work in Progress, Proceedings of the Fourth International Conference on Services Computing, 2007, Salt Lake City, UT. *pp: 694-696*.
- [7] Douglas Brewer, Sujeeth Thirumalai, **Karthik Gomadam**, Kang Li, Towards an Ontology Driven Spam Filter, ICDE Workshops, 2006, Atlanta, GA.
- [8] Kunal Verma, Prashant Doshi, **Karthik Gomadam**, John A. Miller, Amit P. Sheth: Optimal Adaptation in Web Processes with Coordination Constraints, Proceedings of the Fourth International Conference on Web Services, 2006, Chicago, IL. *pp: 257-264 (Acceptance Rate: 17%)*.
- [9] **Karthik Gomadam**, Kunal Verma, Amit P. Sheth, John A. Miller, Demonstrating Dynamic Configuration and Execution of Web Processes, Proceedings of the Third International Conference on Service Oriented Computing, 2005, Amsterdam, Netherlands. *pp: 502-507 (One of the five demo papers published in the proceedings out of 30)*.
- [10] Ranjit Mulye, John A. Miller, Kunal Verma, **Karthik Gomadam**, Amit P. Sheth, A Semantic Template Based Designer for Web Processes. Proceedings of the Third International Conference on Web Services, 2005, Orlando, FL. *pp: 461-469*.

Journal Publications

- [11] E. Michael Maximilien, Ajith Ranabahu, **Karthik Gomadam**, An Online Platform for Web APIs and Service Mashups, IEEE Internet Computing, 2008, 12(5), *pp. 32-43*.
- [12] **Karthik Gomadam**, Ajith Ranabahu, Zixin Wu, Amit P. Sheth and John A. Miller, A Declarative Programming Approach to Process Composition, To appear in the Springer Series on the Semantic Web Services Challenge.

- [13] Kunal Verma, **Karthik Gomadam**, Prashant Doshi, Amit P. Sheth and John A. Miller, Dynamic Configuration and Adaptation of Web Processes, *under revision for ACM Transaction on the Web*.

Invited Papers and Book Chapters

- [14] Amit P. Sheth, **Karthik Gomadam**, Ajith Ranabahu: Semantics enhanced Services: METEOR-S, SAWSDL and SA-REST, IEEE Data Engineering Bulletin, 2008, 31(3). *pp: 8-12*.
- [15] Jonathan Lathem, **Karthik Gomadam**, Amit P. Sheth, SA-REST and (S)mashups : Adding Semantics to RESTful Services, Proceedings of the First International Conference on Semantic Computing, 2007, Santa Clara, CA. *pp: 469-476*.
- [16] Amit P. Sheth, **Karthik Gomadam**, Jon Lathem: SA-REST: Semantically Interoperable and Easier-to-Use Services and Mashups, IEEE Internet Computing, 2007, 11(6). *pp: 91-94*.
- [17] Amit P. Sheth, **Karthik Gomadam**: The 4 X 4 semantic model - exploiting data, functional, non-functional and execution semantics across business process, workflow, partner services and middleware services tiers, ICEIS (Selected Papers), 2007. *pp: 16-26*.
- [18] Amit P. Sheth, **Karthik Gomadam**: The 4 X 4 semantic model - exploiting data, functional, non-functional and execution semantics across business process, workflow, partner services and middleware services tiers, Proceedings of the Nineteenth International Conference On Enterprise Integration Systems, 2007, Fuchal, Portugal. *pp: 1-4*.
- [19] Amit P. Sheth, Kunal Verma, **Karthik Gomadam**, Semantics to energize the full services spectrum, Communications of the ACM, 2006, 49(7), *pp: 55-61*.
- [20] **Karthik Gomadam**, Kunal Verma, Amit P. Sheth, Ke Li: Keywords, Port Types and Semantics: A Journey in the Land of Web Service Discovery. Semantic Web Services, Processes and Applications, 2006, *pp: 89-105*.

Patents

- [21] Fausto Bernardini, Rong Nickle Chang, Perng Chang-shing, **Karthik Rajagopal Gomadam**, Chunqiang Tang, Tao Tao, Edward Cholchin So and Chun Zhang, System and Method for Determining and Optimizing Resources of a Data Processing System Utilized by a Service Request, Status: Filed.

Awards and Accomplishments

- Elected to the Phi Kappa Phi Honor society (2008).
- Cash award from IBM for filed patent. (2007)
- Invited to the prestigious Dagstuhl Seminar Series for the seminar on Autonomous and Adaptive Web Services.
- Recognized for my contributions to the Department of Mathematics and Computer Science, Sri Sathya Sai Institute of Higher Learning.(1999)

References

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Other references available on request.