

Shankar R. Ponnekanti

2650 California St, Apt 70
Mountain View
CA 94040

Phone: (650) 947 1268
[http://cs.stanford.edu/~pshankar/
pshankar@cs.stanford.edu](http://cs.stanford.edu/~pshankar/pshankar@cs.stanford.edu)

Education & Honors

PhD in Computer Science, Stanford University, (Expected) 2005. CGPA: 4.04/4.

B. Tech in Computer Science and Engineering, IIT Madras, 1998. CGPA: 9.8/10, placed second among over 300 students.

Recipient of National Talent Search and National Science Talent Search scholarships during college and undergraduate years in India.

Placed 35th among over 100000 candidates in the Joint Entrance Examination, the common engineering entrance examination for the IIT's.

Research interests

My research interests are in the areas of mobile/ubiquitous computing and distributed/Web systems. My graduate work focused on *service-oriented architectures*. Services are network-resident components that export programmatic interfaces. Such programmatic services were originally popularized by RPC and CORBA, but recently they have also been adopted in the Web, grid computing and ubiquitous computing domains (in the form of SOAP/WSDL, Jini and UPnP). With a large number of services, how do users determine which services are suitable for a given task, and actually interoperate/connect with them to achieve the task? In my graduate work, I examined this question both in the context of ubiquitous computing and Web-based services.

I expect my future work to follow three themes: (1) service integration and composition, (2) providing ubiquitous access to services from mobile devices, while adapting to the limited and widely variable resources on these devices, and (3) developing scientific practices for building well-behaved systems from components. Decomposition into components is an effective way of dealing with the ever-increasing complexity of systems and applications, and services aid in this regard by providing language/platform neutral components. However, combining together components into new systems/applications that meet specific requirements (functional, as well as performance, availability and other requirements) is still a very ad-hoc process, and my long-term goal is to develop systematic mechanisms to this end.

Representative publications

Shankar R. Ponnekanti and Armando Fox. Interoperability among Independently Evolving Web Services. In ACM/Usenix/IFIP Middleware '04, Toronto, Canada, October 2004. (Acceptance rate: 25/181 = 13.8%)

Shankar R. Ponnekanti, Brian Lee, Armando Fox, Pat Hanrahan, and Terry Winograd. ICrafter: A Service Framework for Ubiquitous Computing Environments. In UbiComp 2001, pages 56-75. Georgia, Atlanta, September/October 2001. (Acceptance rate: 14/90 = 15.6%)

Shankar R. Ponnekanti and Armando Fox. SWORD: A Developer Toolkit for Web Service Composition. *In Eleventh World Wide Web Conference (WWW2002, Web Engineering Track)*, Honolulu, Hawaii, May 2002. (Acceptance rate: 20%)

Research experience

Research assistant, Software Infrastructure group (Stanford, Winter 2002 to date). Together with Prof. Armando Fox, I studied the *compatibility problem* for SOAP/WSDL based Web services – considering different service providers are likely to have overlapping but non-identical functionality, how do client applications determine which services provide the needed functionality? I implemented a system called AMIBA (see our Middleware 2004 paper) that demonstrates how the compatibility problem can be effectively solved for services that have evolved from a common “base service”. In later work, we extend our approach to the case where the services are fully independent.

Research assistant, Interactive Workspaces project (Stanford, Winter 1999 to Winter 2002). The interactive workspaces project, an inter-disciplinary research effort led by Profs. Armando Fox, Pat Hanrahan and Terry Winograd, is developing software for enabling new modes of collaboration in technology-rich spaces. With help from fellow graduate student Brian Lee, I designed and implemented a network services framework called ICrafter, using which users can discover and interact with network-connected software-controlled devices such as displays, lights and projectors. The key novelty in ICrafter is that the service UI’s are customized to the user, the environment and the rendering device. (For more details, refer to our Ubicomp 2001 and WMCSA 2002 papers.)

Intern (Hewlett-Packard Labs, Summer 1999). At HP labs, I was part of the MADE project headed by Dr. Lucy Cherkasova, and our goal was to design an efficient load balancing scheme for a cluster of servers hosting Web content. I designed (and evaluated) an algorithm for partitioning (and migrating, as needed) the hosted content across the servers to achieve the best possible cache utilization.

Teaching experience

At Stanford, I was a teaching assistant for three courses:

1. CS444I: Internet Services, taught by Prof. Armando Fox (Spring 1999).
2. CS193J: Programming in Java, taught by Manu Kumar (Summer 2003).
3. CS244A: Computer Networks, taught by Prof. Nick McKeown (Winter 2004).

Professional activities

Reviewer for Ubicomp 2002 Tech Notes, Fourth International Conference on Ubiquitous Computing, Gothenburg, Sweden, 2002.

External reviewer for SOSP 1999, Ubicomp 2001, Ubicomp 2002, WMCSA 2002, Mobisys 2003, Usenix 2004

Skills

Programming languages & technologies: Java, C/C++, XML, Servlets & JSP, Web services (SOAP/WSDL), SQL, TCP/IP, HTTP, HTML

Platforms: UNIX/Linux, Windows

All publications

Web systems

Shankar R. Ponnekanti and Armando Fox. Towards Automated Discovery and Interaction: The Holy Grail for Web Services. *Under preparation*. Draft available at <http://swig.stanford.edu/~pshankar/amiba.pdf>

Shankar R. Ponnekanti and Armando Fox. Interoperability among Independently Evolving Web Services. In *ACM/Usenix/IFIP Middleware '04*, Toronto, Canada, October 2004.

Shankar R. Ponnekanti and Armando Fox. SWORD: A Developer Toolkit for Web Service Composition. In *Eleventh World Wide Web Conference (WWW2002, Web Engineering Track)*, Honolulu, Hawaii, May 2002.

Ludmila Cherkasova and Shankar R. Ponnekanti: Optimizing a “Content-Aware” Load Balancing Strategy for Shared Web Hosting Service. In *IEEE MASCOTS 2000*, pages 492-499. San Francisco, California, August/September 2000.

Ubiquitous/pervasive computing

Shankar R. Ponnekanti, Brad Johanson, Emre Kiciman, and Armando Fox. Portability, Extensibility and Robustness in iROS. In *IEEE International Conference on Pervasive Computing and Communications (PerCom '03)*, pages 11-19. Fort Worth, Texas, March 2003.

Shankar R. Ponnekanti and Armando Fox. Application-Service Interoperation without Standardized Service Interfaces. In *IEEE International Conference on Pervasive Computing and Communications (PerCom '03)*, pages 30-37. Fort Worth, Texas, March 2003.

Shankar R. Ponnekanti, Luis A. Robles, and Armando Fox. User Interfaces for Network Services: What, from Where, and How. In *Fourth IEEE Workshop on Mobile Computing Systems and Applications (WMCSA 02)*, Callicoon, NY, June 2002.

Shankar R. Ponnekanti, Brian Lee, Armando Fox, Pat Hanrahan, and Terry Winograd. ICrafter: A Service Framework for Ubiquitous Computing Environments. In *UbiComp 2001*, pages 56-75. Georgia, Atlanta, September/October 2001.

Brad Johanson, Shankar R. Ponnekanti, Caesar Sengupta, and Armando Fox. Multibrowsing: Moving Web Content across Multiple Displays. In *UbiComp 2001*, pages 346-353. Georgia, Atlanta, September/October 2001.

Andrew C. Huang, Benjamin C. Ling, Shankar R. Ponnekanti and Armando Fox. Pervasive Computing: What is it Good for? In *MobiDE 1999, (Held in association with Mobicom '99)*, pages 84-91. Seattle, Washington, August 1999.

Talks

“Interoperability among Independently Evolving Web Services”, *ACM/ Usenix/ IFIP Middleware '04*, Toronto, Canada, October 2004.

“Interoperability among Independently Evolving Web Services”, *Software Seminar*, Stanford, CA, October 2004.

“Application Service Interoperation without Standardized Service Interfaces”, *IEEE Percom '03*, Fort Worth, Texas, March 2003.

“Towards Spontaneous Interaction in Ubiquitous Computing”, *Spontaneity workshop* held in conjunction with *UbiComp '02*, Gothenburg, Sweden, October 2002.

“User Interfaces for Network Services: What, from Where, and How”, *IEEE WMCSA '02*, Callicoon, New York, June 2002.

“User Interfaces for Network Services: What, from Where, and How”, *Internet and Distributed Systems Seminar*, Stanford, CA, June 2002.

“SWORD: A Developer Toolkit for Web Service Composition”, *WWW '02*, Honolulu, Hawaii, May 2002.

“ICrafter: A Service Framework for Ubiquitous Computing Environments”, *UbiComp 2001*, Atlanta, Georgia, October 2001.

“ICrafter: A Service Framework for Ubiquitous Computing Environments”, *HP Labs*, Palo Alto, CA, September 2001.

References

Available upon request