

# Roshan Kulkarni

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## Professional Experience

Persistent Systems Pvt. Ltd. [<http://www.persistentsys.com>] (July 2003 – July 2005)

Two years professional work experience in the design and development of software products in J2EE and J2ME. Primary areas of work are - Java, SOA and Web Services, Networking and Mobility.

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## Academic Background

<b>M.Tech. IIT Bombay</b> (July 2005 – July 2007) Dept. of Computer Science and Engg., IIT Bombay	<b>CPI 9.0</b>
<b>Bachelor of Engineering in IT</b> (June 2000 – June 2003) Vivekanand Engineering (VESIT), University of Mumbai	<b>67.04 %</b>
<b>Diploma in Computer Engineering</b> (May 1997 – May 2000) Govt. Polytechnic, Board of Technical Education, Maharashtra State	<b>80.66 %</b>

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## Technical Skills

- *Core Java*: Network APIs, Threads, JNI, Security, UI, ANT, JUnit
- *J2EE*: JDBC, JNDI, RMI, Servlets, JSP, Struts Framework, EJB
- *J2ME*: Development of mobile client and portals
  - MIDP 2, WTK 2.2. Wireless toolkits of Sun, Sony, Motorola, Nokia
  - Location Based Services, Antenna, EclipseME, J2ME-Polish
- *Service Oriented Architectures*: SOAP, WSDL, UDDI, Semantic Web Services, OWL, OWL-S
- Strong understanding of OO design principles, design patterns and the software engineering life-cycle
- *IDE*: Eclipse (Plug-in Development), NetBeans, BEA WebLogic Workshop
- *C, C++*: Unix APIs for Networking, IPC, Processes, Threads
- *Web*: HTML, XML, JavaScript, PHP, Perl, CGI
- *Database*: SQL, Postgres, MySQL, ODBC
- *Linux/Unix*: Development, Build Systems, Network & System Admin
- *Build Systems*: make, shell scripting, configuration mgmt using CVS
- *Assembly Languages*: x86, 8051/89C51, 6805

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## Research Publications

IEEE International Conference on Web Services 2007 - Improved Matchmaking Algorithm for Semantic Web-Services Based on Bipartite Graph Matching.  
Dr. Umesh Bellur, Roshan Kulkarni

## Achievements and Awards

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- Awarded JRD Tata and Sir Ratan Tata scholarships for the academic year 2001-02.
- Scored 98.72 percentile in GATE 2004 and 99 percentile NCST G-Level CST 2003.
- First Prize IIT Bombay (Techfest 2002) and First Prize IIT Kanpur (Techkriti 2002) for the project "Automated Navigation and Surveillance Robot".
- First Prize "IEEE-VESIT Best Project Idea" for the project "Free Space Optical Communication using Lasers".
- Presented a talk on "Energy Management Issues in Wireless Sensor Networks" at Sensor Networks Workshop, Persistent Systems, 2004.
- Presented a paper on "Protecting Networks against Denial of Service Attacks" IEEE-VESIT paper presentation, 2003.
- Second Prize in "IEEE-VESIT Software Design Contest" for the project titled "Interactive Filter Response Analysis Tool" in 2000.
- Second Prize in the Hardware Contest at VESIT Technology Day, 2001.
- First Prize "IEEE-VESIT Business Incubation - 2000" for "BrainFood - Online Library for Books"
- As the events-manager at the School of Information Technology, IIT Bombay, I have successfully organized workshops in areas like 'Linux and Open Source' (2006), 'Convergence in Computer Networks' (2007).
- I successfully developed a mobile application platform for a startup (w-PlanIT Communications). Our product was one of the finalists at the Navteq Global LBS Challenge 2007.

## Projects

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### **Location-Aware Travel Portal (J2ME/Web-Services)** [12 months]

Team Size: 2                      Customer: w-PlanIT Communications

- Successfully architected and developed a J2ME mobile application having 20+ screens. Designed a MVC framework for mobile applications. This greatly increased the flexibility of the product design.
- Implemented the J2EE backend portal and the XML-messaging protocols between the mobile-client and server.
- Completed integration with mobile location tracking API and GIS web-services.
- Responsible for the integration of the product with third-party web-services for portal's content.

### **BEA: Rich Internet Application Framework (J2EE/AJAX)** [10 months]

Team Size: 4                      Customer: BEA Systems

- AJAX was in an early evolutionary stage and our team was responsible for prototyping the various approaches to build rich internet applications on BEA WebLogic.
- Achieved the integration of various third-party presentation layers with BEA Weblogic. These included (HTML+JavaScript, Laszlo, Java Applets).
- Responsible for the requirements-analysis and design of a client-side AJAX engine for RIA. The engine had to support client-side CRUD operations on XML content.
- The project demanded a clear understanding of web programming paradigms, Struts, Transactions etc.

### **Matchmaking Algorithm for Semantic Web-Services** [10 months]

Ongoing M.Tech Thesis      Guide: Dr. Umesh Bellur, IIT Bombay

- Identified some open problems in the area of web-service search and completed an exhaustive literature survey.
- Identified several correctness problems with published algorithms for matchmaking of semantic web-services.
- Proposed a new algorithm for semantic matchmaking based on the notion of Bipartite graph matching.
- Proved the correctness and illustrated the performance of our algorithm by publishing experimental results at the IEEE International Conference on Web Services 2007.

### **ReefEdge: 802.11 Wireless Monitoring and Management Products** [12 months]

Team Size: 8      Customer: ReefEdge

- The product was a Linux network appliance used to monitor and configure wireless access points using SNMP.
- I was responsible for the integration of a Java SNMP engine used to push configuration parameters to wireless access points.
- Implemented the communication protocol between wireless sensors and the monitoring appliance using Java networking APIs.
- Responsible for the development of a Multithreaded Daemon Server, Thread Pool and Socket Pool in Java. This design required the careful consideration of race-conditions.
- Successfully implemented the Cisco Discovery Protocol (CDP) for auto-discovery of wireless devices.
- As a build and configuration manager I was responsible for the setup and maintenance of the version control system (CVS) and the Linux build environment (*make, shell scripts*).
- Designed and implemented the server-side caching and event schedulers in the product. The caching mechanism helped to enhance the server performance by ~60%.

### **Defending Web-Servers from Denial Of Service Attacks** [10 months]

Team Size : 4      B.E. Final Year Project

Inspired by a paper from MIT, we proposed and implemented a solution to the problem of Distributed Denial of Service Attacks. The system detects asymmetric flows to a specific IP address and implements a router based pushback mechanism. The required statistical analysis is done using a dynamic tree structure "Multi-level Tree for Online Packet Statistics". The project has given me an excellent exposure to Linux, TCPIP, Network fundamentals, Apache Web-Server.