Abhishek Singh

• abhisheksing@umass.edu   •+1 (413) 824-1385

EDUCATION

Birla Institute of Technology and Science (BITS), Pilani, Pilani Campus   **Aug 2009 - July 2014**

Masters of Science (Hons.) in Mathematics   **8.18/10 GPA**

Bachelor of Engineering (Hons.) in Computer Science

Coursework: Data Structures & Algo., Theory of Computation, Operating Systems, Database Systems, Prog. Lang. & Compiler Construction, Computer Networks, Digital Electronics & Computer Org., Advanced Computer Org., Data Mining, Parallel Computing, Microprocessor Prog. & Interfacing, Graphs & Networks, Discrete Mathematics, Prob. & Stats., Algebra, Elementary Real Analysis, Topology, Measure & Integration, Functional Analysis, Optimization, Fuzzy Logic

WORK EXPERIENCE

➢ Software Robotics Corporation (Soroco), Bangalore

Junior Platform Engineer   **Dec 2016 - Mar 2017**

- **Database Authorization Layer:** Implemented a SSL certificate based authorization layer for accessing database by automation engines and other service entities thereby enhancing data security
- **Automation of Package Deployment:** Fully automated the install/update/uninstall process for automation engines by creating a RPM package of the database service, achieving zero downtime and reduced package deployment error-rate

➢ Citicorp Services India Pvt. Ltd. (Citigroup), Pune

Application Developer Supervisor, Citi Private Bank   **Aug 2015 - Dec 2016**

- **Message Center:** Developed a global messaging application for secure real-time client-banker communication with complete ownership of two web modules and one batch app. Improved scalability, reduced development time by requiring no code changes in the module, for one of the core and frequent use case of addition/modification of mailing templates. Enhanced security by eliminating persistent and non-persistent cross-site scripting vulnerabilities. Redesigned the application leading to 50% reduced message payload for calling Message Center services, improved space and time performance for sending mails to multiple recipients
- **Configuration Management:** Led the development of property management application to be used by all teams in Citi Private Bank. Implemented Java Messaging Service (JMS) for communication between java applications, Remote Procedure Calls (RPC) for Unix services from Java, Digest Authentication for exposed web services, and DynaCache (IBM Cache) for storage and retrieval of objects
- **Proof of Concept (POC):** Implemented multithreaded asynchronous techniques in Java for performance optimization of the messaging application, concurrent hits to web services for performance measurement, HTML to PDF conversion of dynamic web pages, dynamic PDF metadata modification

Application Developer, Citi Equities Technology   **July 2014 - Aug 2015**

- **KDB/Q Web Portal:** With complete ownership, designed and developed a three-tiered web portal that enhanced business intelligence for profit-loss, risk and latency reports for traders in Options Market Making.
- **Risk Report integration into Management Information System (MIS):** Delivered a stable solution that publishes risk data from KDB/Q services (database) to MIS (frontend in ASP.NET) for business managers in North America, making MIS one stop platform for all reports.
- **POC for health dashboard:** Created a dashboard using HTML5, JavaScript/jQuery, KDB/Q to monitor health and other vitals of all the Options Market Making Applications in real time, making it one of the key projects for the new development cycle.

➢ Amazon Development Center, Hyderabad

Software Development Engineer Intern   **July 2013 - Dec 2013**

- **Forecasting Tool:** Developed a VBA tool that predicts weekly ad-hoc vendor truck requirements at a warehouse, improving forecast accuracy and transit time of goods, and reducing business costs by 5-10%

- **Enhancements in Transit Time System:** Implemented APIs, UI tasks, and running/validation of a new Algorithm to be introduced

RESEARCH EXPERIENCE

- **Thesis:** Designed a certificate-less authenticated group key agreement protocol based on certificate-less public key cryptography using random oracle model, bilinear maps, and elliptic curve cryptography. Research paper published as *"Provably secure one-round certificate-less authenticated group key agreement protocol for secure communications"* in Wireless Personal Communications (Springer) 2015
- **Seminar:** Effectively defended my thesis work in front of esteemed faculty members of the Department of Computer Science and Information Systems, BITS Pilani and other students of the division
- **Award:** Won 'Departmental Research Incentive' (INR 25,000) from BITS Pilani for top three pieces of research by students under the thesis/seminar work

ACADEMIC PROJECTS

- **Compiler Construction:** Built a compiler for a custom made C-like language including the Lexical Analyzer and the Semantic Analyzer
- **Web Document Clustering:** Implemented web document hierarchical clustering for news articles using minimum description length based algorithm for attribute ranking
- **Cricket Web Portal:** Developed a web portal to analyze the statistics of cricket players and teams with create, read, update and delete persistent functionalities
- **Mathematical Model of Unemployment:** Designed a model with non-linear ordinary differential equations to simulate the unemployment problem, analyzing stability of the proposed system using Mathematica
- **Automatic Lane Changer:** Built a working prototype with image sensing capabilities that monitored traffic density and shifted state-of-the-art road divider to low density area, hence maximizing road utilization in cities
- **Automatic Irrigation System:** Designed an irrigation system that employed Arduino programming for sensing moisture and motor rotation to control water provision according to type of crop, temperature, humidity and moisture content in soil

ACADEMIC ACHIEVEMENTS AND AWARDS

- Won Star of the Week award for enhancements in Message Center Application of Citi Private Bank, 2016
- Awarded the Merit-Cum-Need scholarship by BITS Pilani, 2012
- Won third prize for the project Automatic Lane Changer, APOGEE'10-National Technical Fest BITS Pilani

PROGRAMMING SKILLS

- **Programming Languages:** C/C++/Java/Python/VBA (Proficient), C#(Moderate)
- **Web Technologies:** HTML/CSS/JavaScript/Ajax/jQuery (Moderate)
- **Web Services:** REST, SOAP (Proficient)
- **Frameworks:** Spring, MyBatis, ASP.NET
- **Query Languages and Others:** SQL/Bash Shell (Proficient), KDB/Q /Mathematica/Weka (Moderate)

EXTRA-CURRICULAR ACTIVITIES AND ACHIEVEMENTS

- Exhibited real-time big data state-of-the-art analytics using KDB/Q in Options Market Making for the global event Citi IT Expo, 2015
- Online tutor of global population of students in Computer Science, Mathematics, and Science since 2014
- Bagged 2nd place in Squash at Intra BITS Sports Meet 2012
- Member of Hockey Team of BITS Pilani
- Regular blood donor since 2010
- Volunteered for Teaching and Blood Donation Camps organized by National Service Scheme, Pilani