

## Resume

### Abhishek Gupta

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**Objective:** To build upon the strong foundation of scientific knowledge and utilize it to pursue deep research in the field of Computer Science and Engineering at a prestigious research organization and contribute towards its research to the best of my abilities. I wish to pursue internship in a challenging, competitive and dynamic environment. This in turn will provide me more space to explore, enhance my abilities and help me to dive deep into my knowledge.

**Research Interests:** Parallel programming, High performance Computing, Distributed Systems

**Academic Background:**

I am a 1<sup>st</sup> year Ph.D. student at the **Department of Computer Science at the University of Illinois at Urbana-Champaign**. I work as a Research Assistant (RA) in the Parallel Programming Laboratory (PPL) with Prof. Laxmikant V. Kale. I received a Bachelor of Technology degree in Computer Science and Engineering from Indian Institute of Technology (IIT), Roorkee in 2008 and then I worked as a Software Design Engineer (development) at Microsoft India Development Centre.

Institution	Examination/Course	Year of Passing	Grade / Percentage
University of Illinois at Urbana Champaign(UIUC)	1 <sup>st</sup> sem Computer Science Graduate Studies	2009	GPA: 4.0/4.0
Indian Institute of Technology(IIT), Roorkee	Bachelor of Technology in Computer Science & Engineering	2008	CGPA*: 9.836/ 10
Saint Xavier's School, Jaipur	All India Senior School Certificate Examination	2004	91.6 %
Saint Xavier's School, Jaipur	All India Secondary School Examination	2002	90.8 %

\*CGPA = Cumulative Grade Point Average

**Undergraduate at IIT Roorkee:****Department Rank : 1**

**Institute Rank : 1** (1<sup>st</sup> amongst all the B.Tech 4<sup>th</sup> year students (around 400) passed in 2008 from IIT Roorkee)

**Projects Undertaken:**

- ✓ At present, I am a **Research Assistant (RA)** at Parallel Programming Laboratory (PPL) with Prof. Laxmikant V. Kale. (<http://charm.cs.uiuc.edu/people/grads/gupta/>) and I am working on:
  - **Scalable startup for parallel application (Charm++ application):** Parallel application today needs to run on tens of thousands of processors. Existing parallel applications such as Charm++ applications suffer from the huge startup cost making them inherently non-scalable. In this project I explored alternative startup schemes and implemented a hierarchical startup of node-programs for very large number of processors (of the order of tens of thousands) to make the startup process faster and more scalable.
  - **Parallelization of BigSim Log transformation:** This project deals with the parallelization of the process of taking the bigsim emulator logs and transforming it on the basis of a different object to processor assignment. BigSim is a

tool which is developed by PPL for simulating PetaFLOPS Supercomputers.  
<http://charm.cs.uiuc.edu/research/bigsim/>

- ✓ **“B-Tech Project-“Parallelization of Crucial Video Surveillance algorithms for Cell Broadband Engine Processor”**- The project involved developing a novel and generic solution to the problem of performing real-time video surveillance based on utilization of the on-chip parallel processing architecture of the Cell BE to obtain the desired speedup. Parallelization of the code required an innovative approach to fully utilize the computational power of Cell BE. The project won the award for **best B-Tech project** in Computer Science at IIT Roorkee.
- ✓ **“Parallelization of Finite Element Analysis of Mechanical Systems with Contact Phenomena”**- Finite Element Analysis of Mechanical Systems with Contact Phenomena is a very common and useful application. However it is very computationally intensive and is very slow when running on uniprocessors. This project involved its parallelization using Charm++ FEM framework and led to significant speedups. The project was done as a part of a course on Parallel Computing.
- ✓ Currently doing research projects on **“Parallelization of Image Processing algorithm for GPGPU”** and **“Running Desktop applications on Android Smartphones”** as part of courses taken during current semester.
- ✓ **“Reconstruction of dynamic 3-D objects using its 2-D images”**- The project involved development of a novel algorithm for generating 3-D model of a dynamic object using the silhouette images obtained from the object. In addition to this, the software called VRML (Virtual Reality Modeling Language) was used to study generated 3-D models of objects.

### **Professional Experience**

**Software Design Engineer (SDE) at Microsoft India (R & D) Pvt Ltd from July 2008–Jan 2009** - Worked in the team **“Microsoft CRM (Customer Relationship Management)”** where I faced the challenges of designing an enterprise product which involves collaboration between different components running on different servers. It has given me deep insights into the different facets of designing and programming for distributed systems.

**Self –Employed** from Feb-2009 to July 2009 – Worked as a freelance coder (online contracts) and computer science expert (online advisor) to solve any issues faced by customers. This gave me deep interaction with customers and hence insights into what areas customers face problems in any particular software and hence helped me to broaden my way of thinking.

### **Internship:**

Successfully completed an 8-week internship at the **Oracle Corporation-India Development Center** - Bangalore from May to July 2007. My project was **“Apache Tomcat Server Management integration in Oracle Enterprise Manager -Grid control and development of multi-threaded SOAP request generator”**.

### **Research Papers:**

- ✓ A conference paper –**“Parallelization of Video Surveillance Algorithm for Cell Broadband Engine”** presented at **“International Conference on Advanced Computing Technologies (ICACT 2008)”** held in Hyderabad, India 26-27 December 2008.
- ✓ A journal paper titled **“Implementation of Video Surveillance Workload for Cell Broadband Engine”** under review for submission (with corrections suggested by reviewers) to **“Special issue on Scientific Computing”**.

### **Professional Membership :**

Active member of **ACM** (Association of Computing Machinery) since 2007 and Member of **IEEE** (Institute of Electrical and Electronics Engineers) for the year 2007.

### **Courses taken during graduate study :**

Parallel Computing, Distributed Systems, Parallel Computer Architecture\*, Parallel Numerical Algorithm\*, Advanced Operating System\*, Independent Study\*

\*These courses are in current semester

### **Courses taken during Undergraduate Study:**

Operating Systems, Advanced Computer Networks, Advanced Computer Architecture, Computer Networks, Artificial intelligence, Fuzzy logic, Computer Architecture, Design and Analysis of Algorithms, Database Management System, Software Engineering, Data Structures, Theory of Computation, Compiler design, Graph Theory, Introduction to digital communication, Signals and Systems, System Software and Telecommunication switching networks and protocols(included Queuing theories).

### **Major Academic Accomplishments:**

- ✓ **President's Gold Medalist** for being the topper of B-Tech (all branches) of graduating batch 2008, IIT Roorkee.
- ✓ Received **Certificate of merit and trust prize** for consecutive years for securing highest CGPA in B-Tech 1<sup>st</sup> year for the session 2004-05 , in B-Tech 2<sup>nd</sup> year for the session 2005-06 and in B-Tech 3<sup>rd</sup> year for the session 2006-07.
- ✓ Was awarded **Certificate of Merit and National Gold Medal** for being in the top 25 candidates at the **Indian National Physics Olympiad-2004**, hence attended a two -weeks orientation camp organized by HBCSE (Homi Bhabha Centre for Science Education ), Mumbai for international Physics Olympiad.
- ✓ Received **Certificate of achievement and honorable mention** for participation in **ACM Asia Programming Contest** at Kanpur Site 2007 at IIT Kanpur.

### **Extra-Curricular Accomplishments:**

- ✓ Presented a paper on “**3-D Reconstruction using medical images**” during Cognizance-2006 and a paper on “**Godel Universe in String Theory**” during Cognizance-2005, the annual technical festival of IIT Roorkee.
- ✓ Received 1st prize in model design competition in **star-gazing** cell during Srishti-2005, the annual exhibition of Hobbies club, IIT Roorkee.
- ✓ Was editor of the school magazine -"X-Rays" for the year 2002-03.
- ✓ Participated in the **2nd National level Inter School Chess Tournament**, organized by CBSE (Central Board of Secondary Education) in the year 2000.
- ✓ Active Member of National Service Scheme (NSS) from July 2004 to June 2006.

### **References:**

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| 1. Dr. Laxmikant. V. Kale,<br>Professor,<br>Department of Computer Science,<br>University of Illinois at Urbana-Chapamign.<br>kale@cs.uiuc.edu | 2. Dr. Ankush Mittal,<br>Associate Professor,<br>E&C Department,<br>IIT Roorkee,<br>ankumfec@iitr.ernet.in | 3. Mr. Rahul Singh,<br>Software Design Engineer,<br>Microsoft India (R & D) Pvt. Ltd.<br>Hyderabad<br>rahusing@microsoft.com |
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