

# CURRICULUM VITAE



Abhinav Bhatele

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## Personal Details

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<b>Permanent Address</b>	"Aashirwaad", 22, Lata Kunj, Agra, U.P., INDIA - 282002	<b>Date of Birth</b>	December 11th, 1983
		<b>Nationality</b>	Indian
		<b>Sex</b>	Male

## Academic Performance at I.I.T. Kanpur

Semester	Semester Performance Index (S.P.I.)	Cumulative Performance Index (C.P.I.)
1st	9.2	9.2
2nd	10.0	9.6
3rd	8.8	9.3
4th	9.3	9.3
5th	9.1	9.3
6th	8.4	9.1

Cumulative Performance Index (C.P.I.) = 9.1/10 (equivalent to 3.64/4.0)

## Professional Courses Taken

CS100 – Introduction to Profession	CS455 – Software Engineering**
CS210 - Data Structures and Algorithms I	<b>CS633 – Parallel Computing**</b>
CS201 - Discrete Mathematics	<b>CS653 – Functional Programming**</b>
CS220 - Computer Organization	MTH101 – Mathematics I
CS330 - Operating Systems	MTH101 – Mathematics II
CS340 - Theory of Computation	MTH101 – Mathematics III
CS355 - Programming Tools and Techniques	PHY102 – Physics I
CS425 - Computer Networks	PHY102 – Physics II
<b>CS335 – Compilers</b>	CHM201 - Chemistry
CS345 – Algorithms II	CHM646 – Bio-Inorganic Chemistry
CS397 - Special Topics in Computer Science	SE333 – Industrial Organic Chemistry
<b>CS422 - Computer Architecture</b>	ESC101 – Fundamentals of Computing
<b>CS350 – Principles of Programming Languages*</b>	ESC102 – Introduction to Electronics
CS497 - Special Topics in Computer Science*	TA101 – Engineering Graphics
<b>CS498 – B. Tech. Project*</b>	ESO202 – Thermodynamics
<b>CS738 – Advanced Compiler Optimizations*</b>	ESO212 – Fluid Dynamics

\* indicates that the course will be completed by the end of this semester, Fall 2004

\*\* indicates that the course is likely to be taken next semester, Spring 2005

## Schooling Information

<b>Class X (1999)</b>	<p><b>Percentage</b> 91.4% ( AISSE conducted by CBSE )</p> <p><b>Institution</b> Delhi Public School, Bokaro Steel City</p> <p><b>Subjects</b> English, Sanskrit, Science, Mathematics, Social Science</p>
<b>Class XII (2001)</b>	<p><b>Percentage</b> 90.8% (AISSCE conducted by CBSE )</p> <p><b>Institution</b> Delhi Public School, Bokaro Steel City</p> <p><b>Subjects</b> English, Physics, Mathematics, Chemistry, Computer Science</p>

## Standard Test Scores

<b>GRE</b>	1320/1600, Verbal: 530, Quant: 790, Analytical Writing: 4.5/6.0
<b>TOEFL</b>	283/300 (computer based test)

## Academic Achievements

- Got the **Academic Excellence Award** for the year 2001-2002 at IIT Kanpur
- Adjudged the best student and awarded the **Gold Medal** in 2000 at school for excellent academic performance
- Was awarded the **SAIL scholarship** in 1999 for Class 10th results
- Listed in the top 0.1% students in C.B.S.E. in Class 10th
- Received certificate of merit in Indian National Physics Olympiad
- Received certificate of merit in Indian National Chemistry Olympiad

## Areas of Interest

- Compiler Design and Optimization Issues
- Programming Languages
- High Performance and Parallel Computing
- Computer Architecture

## Term Papers and Presentations

- Abhinav Bhatele, Shubham Satyarth, *Language and Compiler Issues in Grids*, Supervisor: Prof. Sanjeev K. Aggarwal, Head, Department Of Computer Science and Engineering, I.I.T. Kanpur
- Abhinav Bhatele, *Modeling of Picoblaze processor (a Xilinx product) in Verilog*, Supervisor: Prof. Shashank K. Mehta, Department Of Computer Science and Engineering, I.I.T. Kanpur
- Abhinav Bhatele, *Haskell: A Functional Language*, Supervisor: Prof. Anil Seth, Department Of Computer Science and Engineering, I.I.T. Kanpur
- Abhinav Bhatele, Vikas Kumar, *Implementation of TCP over multiple wireless interfaces and Loss Isolation*, Supervisor: Prof. Bhaskaran Raman, Department Of Computer Science and Engineering, I.I.T. Kanpur
- Abhinav Bhatele, Anupam Dubey, Rohit Dron, *Abstract Expressionism*, Supervisor: Prof. Satyaki Roy, Department Of Humanities and Social Sciences, I.I.T. Kanpur
- Abhinav Bhatele, Abhishek Chandel, Gaurav Agrawal, *Vayudoot: Design of a mechanical scooter*, Supervisor: Prof. Amit Ray, Department Of Humanities and Social Sciences, I.I.T. Kanpur

## Technical Skills

**Programming Languages** C, C++, Java, Scheme, Perl, ML, Shell Scripting, MIPS Assembly Language

**Technologies** Web Scripting, Windows Programming

**Tools** Latex, Lex, Yacc, Perl, Tcl, Make, HTML

**Operating Systems** Equally comfortable on Unix and Windows

**Hardware Description Languages** Verilog, VHDL

## Projects and Research Work

### **Compiler Algorithm Language (CAL): An Interpreter and Compiler**

This is the topic of my B. Tech. project. Compiler Algorithm Language (CAL) has been designed to provide compiler writers with a language which is quite close to actual algorithms. In this project we are providing an interpreter and debugger for CAL which can be used by people for algorithm testing. We are also providing a compiler which will be able to convert CAL programs to C code which can be plugged elsewhere. We are also providing a GUI to make it convenient for the user to use our interpreter, debugger and compiler. Another feature would be web enabling of the entire project so that a remote user would not have to take the trouble of downloading the entire code. Altogether, we are trying to save the compiler writers from the trouble of writing lengthy programs for their algorithms!

Supervisor: **Prof. Sanjeev K. Aggarwal**, Head, Department of Computer Science and Engineering, I.I.T. Kanpur

### **Picoblaze 8-bit Microcontroller**

I am doing this project under the course CS497. The Picoblaze microcontroller is an embedded multiprocessor which has been developed by Xilinx and can be used in other devices. The aim of this exercise is to become proficient in programming in hardware description languages and to modify the existing design to have new functionalities. I am looking into its design and trying to implement and simulate it in Verilog HDL. The next step would be to introduce changes in it for specific use.

Supervisor: **Prof. Shashank K. Mehta**, Department of Computer Science and Engineering, I.I.T. Kanpur

### **GUI for TLC and Xprove**

I did this project this summer (May to July, 2004) as a part of my summer internship. The first part of the project was developing a graphical user interface for TLC, a model checker developed by Leslie Lamport. This was a huge project consisting of large team and I was a part of it. The second part of the project dealt with combining the power of various theorem provers to prove a particular theorem by breaking it into parts, proving the individual parts and then combining them.

Supervisor: **Dr. Stephan Merz**, INRIA Lorraine, Nancy, FRANCE

### **TeX Compiler**

I did this project in the 6th semester in the compiler design course. TeX is a primitive form of LaTeX and is used for writing documents. We built a compiler which could compile a subset of LaTeX and could parse .tex files to give the output in the form of a device independent file. The compiler was written in java. We used using the tools jflex and cups for Lexical Analyzer and Parser generation respectively.

Supervisor: **Prof. Sanjeev K. Aggarwal**, Head, Department of Computer Science and Engineering, I.I.T. Kanpur

### **Performance of TCP over multiple wireless interfaces**

This is a project which I did in the 6th semester under the course CS397. Multiple wireless interfaces is a wonderful way to achieve higher bandwidth over a connection with a mobile client. TCP's inability to distinguish between packet loss and reordering causes it to perform poorly. The problem of packet reordering is solved by using PET Algorithm and Buffer Management Policy (BMP). We solved the problem of loss isolation by using the TCP-in-TCP mechanism between the mobile client and the server.

Supervisor: **Prof. Bhaskaran Raman**, Department of Computer Science and Engineering, I.I.T. Kanpur

### **Extended Nachos Project**

This is a project which I did in the 5th semester in the course Operating Systems. Nachos is an instructional software that runs as secondary OS on Linux. We tried to improve the functionality of different components of this operating system by introducing various features like high level synchronization primitives, thread-scheduling, system calls, console device driver and multiple-user programming support. This project gave us an overview of the way operating systems function.

Supervisor: **Prof. Deepak Gupta**, Department of Computer Science and Engineering, I.I.T. Kanpur

### **Circuit Description using Verilog HDL**

I did this project under Prof. Shashank Mehta in the summers of 2003. It was about describing electrical circuits with the help of a Hardware Description Language called Verilog. We could then simulate the circuits and also pass these as inputs to FPGAs. Once we could describe simple circuits we went on to describe the MIPS processor finally.

Supervisor: **Prof. Shashank Mehta**, Department of Computer Science and Engineering, I.I.T. Kanpur

## **Objective**

As part of my rigorous academic training, I have developed a keen interest to learn more about computer science and its related fields. I have developed a fascination for compilers in particular. So I would like to pursue post-graduation after I finish my graduation in May, 2005. My sole motivation is to learn and gain knowledge and to contribute in research work already going on in this field. I am confident that with the help of my skills and knowledge I shall be able to enrich the work going on and be an important part of it.

## Hobbies

- I am a sincere, hard-working and highly self-motivated individual with good communication skills and capacity to coordinate and take initiative. I have a strong work ethic and am committed to highest levels of professional and personal excellence. I enjoy every bit of the work assigned to me and do it with enthusiasm and try to give in the best. I feel that I have a very strong will power, determination and love doing things in an artistic way.

- Hobbies

- I love painting, sketching, clay modeling and all different sorts of fine arts.
- I enjoy gardening and reading novels.
- I love travelling and photography also.
- I am inclined towards fashion designing and interior decoration.

- Extra-Curricular Activities

- I was the Vice-Head Boy of my school and so organized the school functions and was the master of ceremony for many of them.
- I have actively participated in the making of backdrops for Fresher's Nite, Antaragni and other Hall events in IIT.
- I was the Coordinator of Backdrop Cell in Antaragni-2003.
- I was the Cultural and Events Management Coordinator of the departmental body, ACA in 2003-04.
- I was also a volunteer for the 35th year Alumni Reunion of 2003.
- I was a secretary in Ritambhara, Natyaspandan and Backdrop cells in Antaragni-2002.
- I was a volunteer in Hospitality Cell in Antaragni-2001.
- I was a Student Guide in the Counselling Service, I.I.T. Kanpur for the year 2002- 2003 and 2003-2004.
- I was a Link Student in the Counselling Service, I.I.T. Kanpur for the year 2003-04.