Curriculum Vitæ

Name	Vinayak Pathak
Date of Birth	16th August 1986
Sex	Male
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Phone	+91 9932752806
Languages spoken	English, Hindi
Academic Status	3rd year, B.Tech (4 yr.), Computer Science & Engineering, Indian Institute of Technology, Kharagpur.

Academic Record

- **Undergraduate:** Presently in third year with a *Cumulative Grade Point Average (CGPA)* of 8.14/10.
- **12th grade:** Passed under the Maharashtra State Board with an aggregate of 86.5% in the year 2004.
- **10th grade:** Passed under the Central Board of Secondary Education (CBSE) with an aggregate of 91% in the year 2002.

Projects

- **Discrepancy theory and its application to hypergraphs (July 2007 - present) –** This ongoing project involves the application of discrepancy theory to finding tight bounds for various hypergraph measures. Advisor – Prof. S.P. Pal, Dept. of Computer Science and Engineering, IIT Kharagpur.
- **Making an autonomous personal assistant for offices (July 2007 – April 2009)** - It involves making a robot that can roam around in a given area, construct its map, maneuver to different points in the constructed map and fetch different objects as instructed. The project is being done by a team of ten under the Innovations Lab, IIT Kharagpur. I am involved in implementing various global and local path planning and motion planning algorithms and building a simulator to test them.
- **Computer controlled telerobot (February 2006)** - The project involved constructing a computer controlled toy car along with several GUI's and command line interfaces with a custom protocol to control its motion and detect collisions. Later it was made controllable through the internet using TCP/IP. It was done independently.
- **Developing a 16-bit CPU (January 2007 – April 2007)** – It involved designing a 16-bit CPU from scratch using Verilog followed by burning it on an FPGA. Advisor - Prof. D. Roychowdhury, Dept. of Computer Science and Engineering, IIT Kharagpur.
- **Design and development of a language and its compiler (July 2007 – December 2007) –** It involves a study of different compiler building techniques and tools and using them for the development of a compiler for a custom designed language. Advisor – Prof. Niloy Ganguly, Dept. of Computer Science and Engineering, IIT Kharagpur.

- **A literature survey of Cellular Automata (July 2007 – December 2007) –** It involved an extensive study of the theoretical and applied aspects of Cellular Automata followed by the presentation of a seminar. Advisor – Prof. Krishna Kumar, Dept. of Physics and Meteorolgy, IIT Kharagpur.
- **Self-learning chatterbot for google talk (July 2007 – July 2008)** - It involves programming a chatterbot that can communicate in English using the Jabber protocol and learn through experience. It is being done under the Innovations Lab, IIT Kharagpur.

Relevant courses taken or presently taking (and reference books used)
- Selected Topics in Algorithms (Udi Manber; Shamos & Preparata)
- Compiler Construction (The Dragon Book)
- Operating Systems (Silberschatz; Maurice J. Bach)
- Symbolic Logic
- Formal Languages & Automata Theory (Hopcroft, Ullman & Motwani)
- Computer Organization & Architecture (Hennessy & Patterson)
- Science of Complexity (Steven Strogatz; M. Schroeder)
- Mathematics - 3 (Probability & Statistics by William W. Hines)
- Design & Analysis of Algorithms (Cormen, Leiserson, Rivest & Stein)
- Switching Circuits and Logic Design
- Signals & Networks
- Discrete Structures (Kolman, Busby, Ross)
- Programming & Data Structures
- Mathematics - 1 (Thomas & Finney)
- Mathematics - 2 (Kreyszig)
- Basic Electronics

Readings done independently
- The Art of Computer Programming (Vol. 1) by Donald E. Knuth
- Feynman Lectures on Physics (Vol. 1, 2 & 3) by R.P. Feynman

Research Interests
- Discrete Mathematics
- Computational Geometry
- Artificial Intelligence
- Fractals and Multifractals

Achievements

- **Joint Entrance Examination (JEE) (2005)**- Secured a position in the *top 0.3%* of a total of approximately *2,00,000 students* appearing.
- **National Standard Examination in Physics (NSEP) conducted by Indian Association of Physics Teachers (IAPT) (2004)** - Secured a position in the *top 1% of a total of about 33,000* appearing candidates and hence appeared in the *Indian National Physics Olympiad (INPhO)*.
- **6th National Science Olympiad conducted by the Science Olympiad Foundation (December 2003)** - Was awarded the certificate of distinctive performance.

- **National Cyber Olympiad conducted by the Science Olympiad Foundation (2004)** - Was awarded the Golden Certificate for securing a position in the *top 50 in India*.
- **Kshitij, the Annual Techno-Management Fest of IIT Kharagpur (February 2006)** - Won the 1st *place* in *Nirmaan*, an autonomous toy car design contest and the 3rd *place* in *Ataxia,* out of a *total of approximately 250 participants* from all over India.

Computer Skills

- I have extensively used C, C++, Visual C++, Basic, Visual Basic, PHP, MySQL, HTML, XHTML, Javascript, VBScript, Assembly.
- I am comfortable with Windows, Linux, DOS.
- I have substantial experience with programming 8085, MIPS based 32 bit microprocessors and the AVR Atmega series microcontrollers.

Extra Curricular Activities

- I am an Assistant Editor in *The Scholars' Avenue*, which is the campus newspaper of IIT Kharagpur (the largest campus newspaper in Asia). An online version can be found at the URL http://www.scholarsavenue.org.
- I am a *member of Kharagpur Robotics and Artificial Intelligence Group (KRAIG).* As a member, I am involved in various *Artificial Intelligence projects* and *several teaching programmes.*
- I was the *Literary Secretary of Meghnad Saha Hall of Residence*, which was my hostel during the year 2005-06. As the Literary Secretary, I was responsible for the Hall Magazine. Also, I *organized a week long online event* which got *more than hundred participants* and a *total prize worth of approximately Rs. 2500* was distributed.
- I am a member of KLUG, the Kharagpur Linux User Group.
- Sports of interest – Lawn Tennis