

# KARTIK MOHTA

[kartikmohta@gmail.com](mailto:kartikmohta@gmail.com)

[kartikmohta.com](http://kartikmohta.com)

## Permanent Address

21, Kachipura,  
New Ramdaspath,  
Nagpur - 440 010,  
Maharashtra, India

## Present Address

4039 Chestnut St., Apt. 10  
Philadelphia, PA  
USA 19104  
**Phone:** (+1) 215-821-7023

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## Education

Year	Degree/Certificate	Institute/Board	CGPA/Aggregate
2010 – ongoing	M.S.E. in Robotics	University of Pennsylvania	4.00 (after 1 term)
2004 – 2008	B.Tech. in Electrical Engineering	IIT Bombay	8.32/10
2004	HSC (Class 12 <sup>th</sup> )	Maharashtra State Board	90.67%
2002	SSC (Class 10 <sup>th</sup> )	Maharashtra State Board	87.6%

## Achievements

- Silver Medallist at the 35<sup>th</sup> **International Physics Olympiad (IPhO 2004)** held in South Korea.
- **Institute Person of the Year (Technical Activities)** for the years 2005–06 and 2006–07 at IIT Bombay.
- **All India Rank 108** among around 180,000 students in IIT-JEE 2004.
- **All India Rank 4** in the National Science Olympiad 2004.
- Was among the **National Top 1%** in the National Standard Examination in Physics held in 2003-04.

## Research Experience

- **Memory Subsystem in System-on-Chips**

*August 2007 – April 2008*

The aim of the project was to **implement a cache coherence protocol** for *MemSim*, a multi-processor memory subsystem simulator being developed at IIT Bombay. I designed a protocol and worked on its sample implementation. This project was done under the supervision of *Prof. Madhav P. Desai*.

- **Interference of Light using Lasers and Ophthalmic Lenses**

*December 2005 – December 2006*

We studied the interference patterns due to reflected light from the front and back surfaces of ophthalmic lenses. We got various patterns depending on the type and the power of the lens. This method can be used to characterise the lenses, study the surfaces of the lenses and also detect the imperfections in them. This was done under *Dr. Rajesh Khaparde* at *Homi Bhabha Centre for Science Education*.

## Work Experience

- **Insilica Semiconductors**

*July 2008 – October 2009*

At Insilica, I have worked on a wide range of projects such as programming a VLIW architecture based DSP in a dye-sublimation printer, UI development for Digital Photo Frames (DPF) and parsing of online RSS/Atom feeds from photo-sharing sites to get slide shows of user's online photos on the DPF.

- **GE Healthcare (Internship)**

*May 2007 – July 2007*

During my internship at GE Healthcare (Bangalore) I worked on designing a Serial Peripheral Interface (SPI) on a FPGA in their ECG machines to replace the proprietary interface they had earlier.

## Course Projects

- **Secure Wireless transmission of data using encryption and frequency hopping**

*Autumn 2007*

We made a secure wireless system using encryption and frequency hopping for secure transmission of data. The encryption was done using **PN (Pseudo Noise)** Codes. Frequency hopping ensures that even if someone with a receiver is listening for our signal, he would get only a part of the signal and would not be able to decode it properly, making the system very secure.

- **PID controller**

*Autumn 2006*

The purpose of the project was lifting a variable weight (within some limits) using a motor, to a fixed height which can be set by the user. The motor was controlled by PWM which in turn was controlled by a PID controller. This was done under *Prof. Mukul Chandorkar* and *Prof. Mahesh Patil* as a part of the Analog Electronics Lab.

- **Mathematical Package in C++**

*Autumn 2004*

Developed a mathematical package in C++ which had a wide variety of capabilities including calculating Fourier coefficients of a function, solving differential equations numerically etc. This was done as a course project under *Prof. Sharat Chandran*.

## Personal Projects

- **Micromouse**

A micromouse is an autonomous robot which has to find the centre of an unknown maze starting from one end in the shortest time. In 2007 our micromouse won the Best Design prize at Techfest (the annual technological festival of IIT Bombay). At Techfest 2008, our micromouse came first with a record time of 12.6 seconds placing it amongst the fastest micromice in India.

- **Image Processing**

Developed prototype robots and their software using the OpenCV library for image processing competitions in Techfest 2007, 2008 and 2009. The competitions involved the use of colour detection, edge detection and object detection algorithms of Image processing.

## Electronics and Computer Skills

- **Micro-controllers:** 8051, Atmel AVR, Microchip PIC
- **Languages:** C/C++, Java, Visual Basic
- **Scripting:** PHP, Python, Bash, Javascript
- **Packages used:** Spice, MATLAB, Mathematica, OpenCV, Eagle (PCB Layout)
- **Operating Systems used:** Linux/Unix, Windows, Mac OS X

## Extra-Curricular Activities

- Awarded the **Institute Citation** for contribution to technical activities at IIT Bombay
- Awarded **Institute Technical Colour** for the year 2004-05 for extra-curricular technical activities
- Have **won** various competitions at **Techfest** (the annual technological festival of IIT Bombay):
  1. **Viscometer** (2005) – The task involved making the most accurate meter to measure viscosity of different liquids.
  2. **Decathlon** (2005) – It was a team event, consisting of several small competitions related to various branches of engineering.
  3. **iClean** (2006) – This event required us to make an autonomous vacuum cleaner which cleaned up the floor guided by a grid of lines laid on the floor.
  4. **Codemaestros** (2007) – This was a team event consisting of various parts, each related to a different domain of computers like programming, networking etc.

## Posts Held

- Was the convener of the Electronics Club of IIT Bombay for 2006-2007
- Served as the System Administrator of my hostel at IIT Bombay for the years 2006-2008
- Was the Computer Secretary of my hostel at IIT Bombay for the year 2005-2006