4317/3 Ansari Road
Darya Ganj, New Delhi
☎ +91 89681 72389
✉ toAtulArora@gmail.com

Atul Singh Arora

http://github.com/toAtulArora
http://KnowledgePayback.blogspot.com

Objective

..of the document — To get a summer intern-ship to explore Quantum Mechanics in further depth

..in general — To become a good human being and to be able to contribute to expanding our knowledge of nature.

Education

Present — **BS-MS Dual Degree**, *Indian Institute of Science Education and Research*, Mohali, *8.6/10*.
BS 2nd Year, Major yet to be chosen

2010 — **CBSE 10+2**, *Sardar Patel Vidyalaya*, New Delhi, *80%*.
Physics, Chemistry, Math, Computer Science, English

2008 — **CBSE X**, *Sardar Patel Vidyalaya*, New Delhi, *93%*.
Science, Maths, Social Science, English, Hindi, Information Technology

Experience

Summer 2012 — **Intern**, *Indian Institute of Science Education and Research*, Mohali.
Studied Group Theory and Linear Algebra for understanding Symmetry, under Prof. Kapil Hari Paranjape.
A brief introductory understanding of the Knot Theory was also undertaken. LaTeX was learnt during this period, to be able to efficiently communicate via the internet.

Summer 2011 — **Intern**, *Indian Institute of Technology*, Bombay.
Worked on Image Recognition techniques using OpenCV, for Yarn Fault detection under the supervision of Prof. Anirban Guha.
This was an extension to an IIT alumni's Masters thesis. The work was done using Visual Studio, C++ and involved understanding of OpenCV and the idea behind various algorithms, to be able to solve the problem at hand.

Projects

Sem III 2012 — **Opportunity Cell Website**, Team Project, A centralized web portal for the Opportunity Cell of IISER Mohali.

Sem III 2012 — **Fly Count Assister**, For easing the task of counting flies (Biology experiment), this application was written in Python and used extensively. With just two buttons on the keyboard, and the voice support, the counting process was made much more efficient.

Sem III 2012 — **NaveenTantra**, Team Project, An Online Election system, based on a novel fraud prevention technique, created using Javascript, PHP and mySQL.

Summer 2012 **Telescope**, Team Project, Newtonian Reflection Telescope for observing Transit of Venus.

Sem II 2012 **Capacitive Touch Sensor**, Sensitive enough to measure changes in PicoFarads, developed for the Science Day.

2010-11 **Stepper Motor Controller**, Developed with the aim of application in robotics, this project was designed to control the torque and speed of stepper motors, with precision, independently. This was implemented using C as the language and Atmel AVR as the platform.

2010 **Live GSM**, This was an attempt at controlling a phone using a microcontroller, to be able to remotely control devices, using DTMF communication protocol over voice calls.

Class XII 2010 **3D Modelling and Animation**, Imitated the '21st Century FOX' animation and customized it to read 'XII class presents', for a class presentation, using the popular 3D cinema creation software, Maya.

Class XI-XII 2009-10 **Space Race**, This game was developed using OpenGL to ensure cross-platform support and as a transition to the open world. Apart from the 3D-graphics, this game had Newtonian physics implemented using a point particle approach, derived from an open-source game.

Class XI 2009 **Robotic Rescue Vehicle (RRV)**, It was designed using auto-mobile parts such as bicycle chains and sprockets, wiper motors, car batteries, a web-camera, and an ordinary PC, which gave it a unique look. It could be moved around wirelessly using a laptop which gave a live video feed from the robot, ideal for rescue operations.

Class X 2008 **Math Project**, A calculator built using micro-controllers, to verify the property $(a+b)(a-b) = a^2 - b^2$. It was a battery operated device, with an LCD screen and used an 89S52 to process.

Class IX 2006 **ALive City 2 - DirectX 9.0**, My second attempt at game making; this was developed without using any game engines, while the game itself was controlled using a USB steering wheel, built by me, based on an open-source application.

Class VIII 2005 **Motion Detection - Image Processing**, This program was developed to save frames of a video feed, only when motion is detected, ideal for surveillance.

Class VIII 2005 **ALive City - DirectX 8.0**, My first computer graphics 3D project, a simple racing game where the player could put his/her own picture, right on the car.

Class VII 2004 **Edge Detecting Robot**, Built using stepper motors and a microprocessor, this vehicle was programmed to detect edges of a table using infra red sensors and turn to avoid falling.

Class VII 2004 **AT Keyboard Interface**, Built using the 8051 series of Microcontrollers and an LCD, this device was developed to serve as a low cost portable typing tutor for kids. It was programmed using Bascom, a basic compiler.

Class VII 2004 **School Bell Scheduler 2**, This application was re-written in Visual Basic.NET to automate ringing of school bells, given the schedule, like it's first version. It used UART for securer communication and was installed in Srijan School, Model Town, New Delhi.

Class VI 2003 **School Bell Scheduler**, A program, written in Visual Basic 6, for automating the ringing of school bells. The user simply needs to specify the schedule.

Recognition

2012 Capacitive touch won the Best Physics Demonstration, at the Science Day 2012, organized by IISER Mohali

2011 Was awarded the KVPY fellowship, for my work on Stepper Motor control

2010 Was awarded the First position in Senior programming, with my Team member, in an inter-school programming competition, a part of Access, an annual Computer Symposium, Access, organized by Modern School

2010 I was selected as one of the participants for attending the Bright Green Youth, Denmark, an international climate summit for the youth, on the basis of my performance in the National Science Fair and a personal interview. In DK, our team made it to the top 14 projects

2009 The Robotic Rescue Vehicle was awarded the first position in the Delhi region and second position in the Northern region, at the National Science Fair, held at the National Science Centre, New Delhi

2005 ALive City won the first place in the open Software Display, at an inter-school Computer Symposium, Access, an annual event organized by Modern School, Barakhamba Road, New Delhi

2004 ALive City qualified the open Software Display, at the inter-school Computer Symposium, Access

2004 Displayed the Robotic Rescue Vehicle at an interschool competition and secured the third position, even though due to a component failure, the robot failed to work when it was judged

2003 Displayed the School Bell Scheduler at the National Convention 2003, Computer Society of India, IIT-Delhi

Languages

Native **Punjabi**

Fluent **English** *Formally studied till the 1st semester, BS-MS*

Fluent **Hindi** *Formally studied till class X*

Computer Skills

Familiar OSs Windows: XP, Vista, 7; Linux: Ubuntu, OpenSuse

Languages Basic, C, C++, C#, Python, Javascript, SQL, HTML, PHP, LaTeX

Applications Visual Studio, Sublime Text, Microsoft Office (Word, Powerpoint, Outlook, OneNote, Excel), CorelDraw, Git, Sony Vegas, Autodesk Maya, GNU plot, SolidWorks, FL Studio, Sony Sound Forge

Extra-Curricular Activities

Guitar Music has enthralled me since childhood. Guitar started out for me as an adventure and till date I continue to learn. I had developed fluency in playing off of the staff notation, in addition to being able to play the common open and barre chords. I am still a novice though.

Programming	This is one of my favourite activities and for me, it's more of a tool that enables me to harness the full strength of the computer, as in it's absence, I feel restricted. I have programmed in various languages, with various objectives, ranging from pure entertainment, like Games, to programming a robot's movements.
Electronics	I have always been fascinated by automation and was fortunate to be exposed to electronics at an early age. I have used 8051 series of microcontrollers using Basic as the language. I later learnt C and moved to the AVR series. I have experience with various components such as MOSFETs, TRIACs etc. which assist in operating other devices.
Debating	I am presently a member of the Debating Society and enjoy the thrill of Parliamentery Debating, which sharpens your real time thinking, provides clarity and at the end of the day, helps you make better notes!
Phonetics	We all know how words are never pronounced the way they're written, in English that is. Yet we're never taught how to read the script that tells us how to pronounce them! So once you learn the script, you realize everybody's fallible.
Tabla and Taekwondo	They're clubbed here since both these activities, I was formally trained in. I was a 'Red One' belt and learnt Tabla for over 3 years. However neither of these, have I been able to pursue lately.

About Me

Research Interests	I haven't studied enough to do research, but I am most interested in Physics. I am particularly fascinated by Quantum Mechanics, and the associated Quantum Computing area. Both, the inherent counter-intuitive behaviour of microscopic particles, and computing, are topics which are very close to my heart.
In General	I adore science. I have experienced numerous 'tears of joy' moments while studying books by authors such as 'Goldberg', 'Artin' and 'Griffiths'. I am unable to leave problems unsolved (which is almost a curse for writing examinations) which has helped me learn a lot over the years. I like working on projects and studying. I dislike examinations, or atleast the kind we've taken so far. I value team work.
Beliefs	I believe that nothing worth having, comes without sacrifice and that as long as I'm working intelligently and hard, I shouldn't be disappointed by failures.
Patriotism	I firmly believe that this nation can strive to excellence, regardless of how unlikely it seems, for it is these few people who believed, have in the past, changed the map of the world, to what we see it as today.