CURRICULUM VITAE:

PERSONAL INFORMATION:

Amal Agarwal

5th Year Undergraduate,
Dual degree, Engineering Physics
Department Of Physics,
Indian Institute of Technology, Bombay.

E-mail address: amal.agarwal@iitb.ac.in
amalag.19@gmail.com

Phone: 91 8097758649

Date of Birth: 19th November, 1990

Permanent Address:
C-404, Surel Apartments,
Near Devashish School,
Bodakdev,
Ahmedabad - 380015.

EDUCATION:

- Indian Institute of Technology, Bombay:
  5th year Dual Degree (Nano-science), Engineering Physics.
  Cumulative Performance Index (CPI): **8.96** on a scale of 10 (at the end of 8th semester).
- Maharaja Agrasen Vidyalaya, Ahmedabad:
  Central Board of Secondary Education (CBSE).
  Class XII: Overall Average **93%**.
  (Mathematics - 99% Physics - 94% Chemistry - 97%)
- Maharaja Agrasen Vidyalaya, Ahmedabad:
  Central Board of Secondary Education (CBSE).
  Class X: Overall Average **89.5%**.
  (Mathematics - 97% Science - 92%)

SCHOLASTIC ACHIEVEMENTS:

1. Currently ranked 2nd among the dual degree students in the Department at the end of 8 semesters.

2. Changed Branch from Dual Degree Metallurgical and Materials Science to Dual Degree Engineering Physics at the end of first year at IIT Bombay (on the basis of CPI).

3. Secured an All India Rank of 2467 (amongst about 4,00,000 students, with a percentile of 99.40) at the national level Joint Entrance Examination for the IITs.

4. Secured an All India Rank of 2485 in AIEEE.

5. Selected for the outstanding achievement award during the annual day celebration of Institute for Plasma Research (IPR), Gandhinagar held on 29th November 2008.

6. Secured All India/State/City/School Ranks 627/20/3/2 in the Nationwide Interactive Science Olympiad 2007 held on 12th September 2007 in India and abroad.

7. Secured second position in the Cadbury Bournvita Intra-school Quiz Contest held on 30th December 2003.

PROJECTS UNDERTAKEN:

1. Bayesian approach of nearfield acoustic reconstruction using particle filters – project as a part of Summer Internship Programme in National Tsing Hua University (NTHU), Taiwan under the guidance of Prof. Dr. Ming Sian Bai during May-July 2012. Accepted as a research article (to be published) in **Journal of the Acoustical Society of America**, Volume 133, Issue 6, pp. 4032-4043 on 12 April, 2013.
   Description:
   - Survey of the current literature on Estimation Theory and Particle Filters.
   - Application of the Particle Filter approach to estimate virtual source amplitudes and source locations thereby reconstructing the original acoustic field.
   - Simulation in Matlab.

2. Generation of Penrose Tiles – project as a part of Supervised Learning course under the guidance of Prof. Dr. Kantimay Das Gupta during July-November 2011.
   Description:
   - Developed an algorithm to generate points in non-periodic penrose tiling using nodal analysis.
   - Exhibit in the form of a puzzle in Techfest 2012, the largest technical festival of India.

3. Light Control Module and Light Lock – project as a part of Microprocessor laboratory under the guidance of Prof. Dr. Pradeep Sarin during September-November 2011.
   Description:
   - Designed and tested a light control module comprising of PIR sensor circuit, LDR circuit and microprocessor that responds to the light intensity and controls output parameters of an electrical device. Major applications in power saving.
   - Designed and tested a light lock comprising of LDR circuit and microprocessor that responds to only certain predefined patterns of light. Major applications in cost effective security.

4. Neural Network Modelling in C. Elegans – project as a part of Summer Students Programme in Institute for Mathematical Sciences (IMSc.), Chennai under the guidance of Prof. Dr. Sitabhra Sinha during May-June 2011.
   Description:
   - Read published papers on different models of neuronal activity in C. Elegans.
   - Coding in Matlab and Mathematica.

5. Non-linear Fluid Dynamics and Turbulence – class presentation as a part of non-linear dynamics course during November, 2010.
   Description:
   - Studied non-linear fluid dynamics, turbulence and Navier-Stokes equation in detail.
   - Explained the different concepts to classmates.

6. Auxetic Materials – project as a part of Materials and Technology course during March, 2009.
   Description:
   - Made a model with straws and rubber bands depicting materials with negative Poisson's ratio.
   - Designed a poster explaining the related concepts.

7. Age of Chempires – competition organized by Azeotropy, the annual department festival of chemical engineering during February, 2009.
   Description:
   - Identified technical faults at different stages of a production unit given a virtual fully functional manufacturing industry.
   - Resolved errors at minimum expenditure.

8. UID (Unique Identification Database) – programming using C++, part of CS101 course during October, 2009.
   Supervisor: Dr. D.B. Phatak, Department of Computer Science, IIT Bombay.
   Description:
   - Database creation, storage for more than 750 students via loops, fingerprint input and storage (software provided), cross-checking for counterfeit data and fingerprints.
   - Unique identification by thinning of lines and judgement by pattern reading of the prints.
   - Application for keeping personal information, marks, attendance.

9. F1 Car – competition organized by Technic at IIT Bombay during September 2009.
   Description:
   - Made a fully functional remote controlled car.

COMPUTER KNOWLEDGE:

- Received training in C++ coding during first semester.
- Other softwares: MATLAB, SCILAB, MATHEMATICA, PYTHON, SAGE, HTML & LATEX.
- Preliminary knowledge of SQL.
- Fluent in using Windows 7 / Vista / XP and Linux operating systems (Ubuntu).
- Proficient in MS Word, Excel, Access, Powerpoint, etc.

COURSES COMPLETED BY APRIL 2013:

Physics:

1) Optics
2) Photonics
3) Electromagnetism
4) Electromagnetic Theory I
5) Thermodynamics
6) Waves & Oscillations
7) Classical Mechanics
8) Quantum Mechanics-1
9) Quantum Mechanics-2
10) Statistical Physics
11) Advanced Statistical Mechanics (Elective)
12) Introduction to Condensed Matter Physics I
13) Semiconductor Physics (Honor)
14) Physics of Quantum Devices
15) Introduction to Atomic and Molecular Physics
16) Methods in Analytical Techniques
17) Introduction to Nanoscience and Nanotechnology
18) Physics of Nanostructures and Nanoscale Devices
19) Nanomaterials, Nanostructures & Nanofabrication
20) Quantum Information and Computing (Elective)
21) Superconductivity And Low Temperature Physics (Elective)
22) Group Theory Methods (Additional Learning)
23) Methods in Experimental Nuclear and Particle Physics (Honor)

24) Introduction to Nuclear & Particle Physics
25) Non-Linear Dynamics (Honor)
26) Continuum Mechanics (Honor)
27) Supervised Learning (Honor)

Mathematics:

1) Calculus
2) Linear Algebra
3) Differential Equations I & II
4) Complex Analysis
5) Numerical Analysis

Statistics (Minor):

1) Introduction to Probability Theory
2) Statistical Inference
3) Regression Analysis
4) Applied Stochastic Processes

Lab Courses:

1) Physics Lab (1st semester)
2) Engineering Drawing (1st semester)
3) Chemistry Lab (2nd semester)
4) Mechanical Workshop (2nd semester)
5) Experimental and Measurement Laboratory (3rd semester)
6) Electronics Laboratory I (3rd semester; Uses of Oscilloscope, Diodes, MOSFET)
7) Electronics Laboratory II (4th semester; Analog Electronics)
8) Physics Laboratory I (4th semester)
9) Electronics Laboratory III (5th semester; Microprocessors)
10) Electronics Laboratory IV (5th semester; Digital Electronics)
11) Physics Laboratory II (6th semester)
12) Physics Laboratory III (7th semester)
13) Advanced Laboratory Techniques in Nanosience (8th semester)

Others:

1) Course on C++
2) Probability and Statistical Methods
3) Micro-controllers
4) Inorganic, Organic and Physical Chemistry
5) Introduction to electrical and electronic circuits (includes MOSFETS, DIODES)
6) Introduction to Renewable Energy technologies
7) Environmental Studies
8) Economics
9) Philosophy
10) Fuel Cells (Elective)

DECLARATION: The information presented above is correct and true to the best of my knowledge.