Milind Hegde

+91-99-8670-8610 ✶ *milind.hegde@gmail.com* ✶ *milindhegde.github.io*

Education

2012 – Present

Bachelor of Science, *Indian Institute of Science*, Bangalore

Major in Mathematics, expected to graduate in May 2016. In the top 2 of the mathematics majors group of 21.

Latest Term GPA: 7.8/8 Cumulative GPA: 7.6/8

Has taken and excelled in advanced mathematics courses including measure theory, probability theory, stochastic processes, functional analysis, algebraic topology, real & complex analysis, commutative algebra, Galois theory, representation theory.

Exam Scores

GRE (Revised General)	Verbal 170/170 (99 percentile)	Quantitative 170/170 (98 percentile)	Analytic Writing 5/6 (93 percentile)	
GRE Subject (Mathematics)	To fill when made available officially.			
TOEFL	Reading 30/30	Listening 30/30	Speaking 30/30	Writing 28/30

Research Experience

August 2015 – Present

Final Year Research Project, IISc

- Studying harmonic analysis, singular operators, and the Fock space.
- Working on an open problem regarding the boundedness of a certain class of integral operators on the Fock space (see Integr. Equ. Oper. Theory 81 (2015), pg. 451–454.)
- Gave a short proof of the unitary equivalence of the Hilbert transform to an integral operator on the Fock space.
- Under the guidance of Prof. S. Thangavelu.

June 8 – July 9, 2015

Participant in Visiting Students' Research Programme, TIFR, Mumbai

- Studied algebraic number theory, including Dedekind domains, unique prime factorization of ideals, finiteness of class number, and Dirichlet's unit theorem.
- Wrote a report briefly sketching some of the important theorems mentioned and their proofs.
- Gave a twenty minute talk titled *The Sign of the Gauss Sum*.
- Under the guidance of Prof. Sandeep Varma.

May 5 – June 19, 2014

Research Project, IIT-Bombay

- Studied graph theory, extremal combinatorics, and the Complete Intersection Theorem. Wrote an expository article explaining the proof of the latter.
- Worked on a conjecture in extremal graph theory regarding the minimum size of the maximum cycle length in a certain class of graphs.
- Made some headway for small cases as well as for sufficiently large ones.
- Under the guidance of Prof. Niranjan Balachandran.

Summer 2013

Summer Project at Physics Department, IISc

- Studied fluid mechanics and the Plateau-Rayleigh Instability. Wrote a report summarizing the properties of the instability.
- Under the guidance of Prof. Arnab Rai Choudhuri.

Course Projects

2014 **Wiener chaos decomposition to solve a stochastic differential algebraic equation.**

- Course: Introduction to Scientific Computing; Prof. S. Raha, IISc Bangalore.
- Analyzed the effectiveness and efficiency of Wiener chaos decomposition as an alternative to Monte Carlo methods to solve a particular stochastic differential algebraic equation numerically.

2014 **Sexual Selection with a Two Locus Model**

- Course: Mathematical and Theoretical Ecology; Prof. Vishwesha Guttal, IISc Bangalore.
- Modeled the effects of sexual selection on two loci in haploid and diploid systems analytically in several cases.
- Studied conditions for equilibria of the system and determined their stability.
- Analytically determined conditions for the invasion of a mutant allele into the population.

Camps Attended

2014 **Aspects of Mathematics,** IMSc Chennai

- Two day programme featuring lectures on various aspects of mathematics and research by experts.

2012 **Vijyoshi Camp,** IISc Bangalore

- Three day series of talks by experts on a wide range of fields of science and mathematics. The top approximately 600 students of India are selected to attend.

Extracurriculars & Other Experience

2015 **App Coordinator,** *Pravega,* IISc's Science and Technology Festival

- Was responsible for and coordinated the development of the Pravega map with an external developer.

2014 **Editorial Coordinator & Designer**, *Quarks Magazine*, IISc UG

- Managed the editorial team and coordinated with other teams to bring out the magazine successfully and on time.
- Designed 3 articles in full, and was heavily involved with overall typography and typesetting of the magazine.

2013 **Editor**, *Quarks Magazine*, IISc UG

- Selected for skill in writing, composition, editing. Further contributed to the magazine by ensuring that typographic rules were followed throughout.

2013 **Core Committee Member**, *Pravega*

Tasked with major aspects of the fest, including website, design, events, and its founding.

- Was personally responsible for Pravega's General Quiz and complete website.

2013 **Head of Web Team,** *Pravega*

Responsible for every aspect of the website (pravega.org/pravega2014), such as designing, coding, and administration. In particular,

- Implemented a login system with industry-standard cryptographic practices.
- Learnt PHP and MySQL for the purpose.

2013 **Web Designer of IISc UG Website**

- Designed and coded the IISc UG website (iisc.ernet.in/ug).

2013 **Typesetter**, *Scipher,* IISc UG Mock KVPY Exam

- Typeset the entire Scipher question paper for both the SA and SX question papers. Learnt to use LaTeX to write equations, chemical structures, physics diagrams.

2013 **Actor**, *Photograph 51*

- Played the role of James Watson in the play *Photograph 51* about the discovery of the structure of DNA.

Skills & Strengths

Programming Has experience programming in several languages, including *C, C++*, R, Matlab, JavaScript, PHP.

Software Comfortable with Microsoft Word, Excel, PowerPoint, Adobe InDesign, Adobe Photoshop, Mathematica, Matlab, R, LaTeX, among others.

Typesetting, Design, Typography Sensitive to font choice, spacing, placement and arrangement of text, and overall design choices of documents.

Honours & Achievements

2013, 2014 **ACM ICPC**
Qualified to the national level of the ACM ICPC, a prestigious international programming competition, of which approximately ten teams qualify to the international finals.

2012 – Present **Kishore Vaigyanik Protsahan Yojana (KVPY) Fellow**
Awarded the KVPY Fellowship through the SX Stream. Among approximately 500 top students of science in India showing an aptitude for research.

2008 – 2012 **National Talent Search Examination (NTSE) Scholar**
Awarded to the top 1000 students in India each year.

2012 **CBSE Group Mathematics Olympiad (GMO) Awardee**
Qualified the GMO to write the INMO (Indian National Mathematics Olympiad). Among 6 selected from across the country's CBSE schools.

2012 **Best Outgoing Student**
Honoured with the title of best outgoing student out of the 100-strong 2012 batch at Sri Kumaran Children's Home.

Relevant Coursework

Undergraduate Level

- Real Analysis
- Linear Algebra
- Algebra
- Topology
- Number Theory
- Automata Theory & Computability
- Multivariable Calculus
- Ordinary Differential Equations
- Intro to Scientific Computing
- Mathematical and Theoretical Ecology
- Probability & Statistics

Graduate Level

- Information Theory
- Measure Theory
- Probability Theory
- Galois Theory
- Representation Theory
- Commutative Algebra
- Complex Analysis
- Stochastic Processes (martingales and Brownian motion)
- Algebraic Topology
- Functional Analysis