Throughout my life I have always found myself very interested in any application of logical analysis and reasoning whether it is in studies or real life. As a result from school life to college, the one thing that remained a constant was my love for mathematics. The absoluteness of the subject is exactly what fascinates me. This fascination is what prompted me to take up the branch of Mathematics and Computing at the Indian Institute of Technology, Guwahati and is the reason I decided to pursue Wharton's PhD program in Finance.

My coursework over the last four years has been a unique blend of mathematics – pure and applied – as well as computer science combined with finance. As a result, I have been exposed to both the theoretical and practical aspects of finance. A wide plethora of topics have been covered in these four years giving me a wholesome perspective into finance with courses on Monte Carlo Simulation, Game Theory, Computational Finance, Financial Risk Management and Modelling and Portfolio Theory as well as courses on Discrete Mathematics, Matrix Computations and Probability Theory. It is due to this comprehensive training that I am able to say with confidence that I would be able to handle the demands of research and industry positively and innovatively.

The first time I got an opportunity to delve into scientific research was during the second year of undergraduate study when I interned under Prof. Sudip Gupta at the Indian School of Business. The goal of the internship was to assist Prof. Gupta in formulating a model that can determine the optimal bidding strategy in a real options market with uncertain demand like the oil industry. Here I got a first-hand experience of research, how first a research idea is conceived and then its feasibilities analysed through extensive mathematical modelling in order to finally create something substantial. That was the first time that I got an opportunity to actually apply almost every course that I had taken up so far from Probability Theory to Scientific Computing to Monte Carlo Simulation to Game Theory. Thanks to my strong background in mathematics and statistics, my work mainly entailed working out the mathematical aspects of market models defined by Prof. Gupta and checking the feasibility of the models. With that end in mind, I was required to read research papers dealing with such models and optimisation techniques. In the subsequent weeks, I developed MATLAB codes for several variations of a real options market model. The experience was highly rewarding and taught me a lot about the application of the knowledge that I had so far acquired.

My third year internship, as it happened, seemed to perfectly complement my previous internship. I secured an internship in the Market Risk Technology Department at Goldman Sachs, India during the summer of 2011. On one hand, my second year internship taught me the various aspects of research and developing new ideas while this internship was about working on a well-developed system, understanding it's functioning and making enhancements to further its usefulness. Here, the work involved implementing distributed computing to collect and modify a large amount of data over a distributed farm of machines. The other half of my work entailed data integration and then conducting an analysis to determine whether a particular process was cost worthy. The biggest challenge was to understand the system already in place to be able to modify it as per requirement. In the process of doing so, I was introduced to the actual use of the concepts like market risk and the various ways to estimate it using VaR or Scenario analysis in real world analysis. I was

able to visualise and understand the application of many of the theoretical ideas that I had so far only studied in textbooks. Also for the first time, I had to handle over five thousand lines of high risk code while juggling huge amounts of data. The project was successful and was helpful in outlining the processes which were not worthwhile and hence can be avoided. My work was put into production towards the end of my internship period.

Of course there was another aspect to the internship wherein I was living independently in a new city and found that I really enjoyed it. I learned to fend for myself and manage my own life.

My undergraduate thesis is on the problem of pricing of Asian options. Currently, any pricing done for exotic options like Asian options is using Monte Carlo Simulation which is considerably time-taking. Hence there is a need for other methods. So far I have implemented two approached. The first approach is using the Monte Carlo Simulation where the solution is further improved using variance reduction techniques like antithetic variates and control variates. Secondly, the pricing is explored numerically by solving the partial differential equation using a Crank-Nicolson implicit method. The results were found to be quite close and the Crank-Nicolson approach was observed to be much faster. My intention is to explore other schemes like Higher Order Compact Scheme in the coming semester. Further this study motivated investigation in the area of non-uniformity. Hence, another objective I have is to model for a non-uniform grid. The sense of satisfaction that my work provided is what strengthened my resolve towards a career in research in this field.

My parents were a great inspiration for me growing up. Being reared up with a mother full of academic ambiance, it had never been difficult for me to choose an academic career. I had observed my mother's research work with interest and from then I have been aspiring for a life of research activities. My mother instilled in me the true meaning of scientific inquiry. My father set a wonderful example of perseverance and diligence for me. His exemplary work with his unrelenting honesty has been a great source of inspiration for me for my endeavours throughout my life. These qualities of my parents which I have tried to emulate are what I strongly believe, the most important factors for an individual to arrive at his or her cherished destination.

I believe in helping those who need our help. Ever since my school days in the Notre Dame Academy, I have been involved in educating underprivileged children. I have been a part of an initiative called the Zero Illiteracy Zone in IIT Guwahati since its inception. Zero Illiteracy Zone is an initiative by the students of IIT Guwahati to bring literacy to the neighbourhood in the short term and slowing increase the Zone. Our aim is not only to spread bookish knowledge but to educate the children about life in general, from handling a bank account to the importance of their identity and their signature. I believe the only way to rise above your surroundings is by education and that is what we aim to achieve. We are planning to expand and teach the 11-12 students and to get professional teachers involved in the later stages.

During my second year, I discovered game theory which I consider to be the perfect application of mathematics. My aspiration is to be able to work in this sphere and continue on with the legacy left by John Nash ever since I read A Beautiful Mind. Since then I was

hooked, so much so that I ensured that my second year internship was on game theory and also chose my seminar topic as 'Commitment Games' which is a two-stage game. The application of game theory to the world of finance would be the perfect research area. With this ides in mind, I am currently looking for a project on game theory. As someone who eventually wishes to contribute to research in this area, I plan to follow this up with a doctoral degree. Thereafter I see myself being a part of cutting edge research in academia or industry and gaining vital experience to handle strategic decisions and challenges in real-life situations. My undergraduate training at IIT and my proactive attempts at gaining experience have adequately prepared me for this purpose.

I believe that my excellent academic record, dedication and a keen desire to learn makes me an ideal candidate for the **Wharton's PhD program in Finance**. This degree appealed to me primarily since it is unparalleled in the world of finance with its emphasis on theoretical as well as empirical tools of modern finance. The faculty teaching the program also has the reputation of being the best in the world and I would be honoured to be taught by them.

This fits exactly the environment I am looking to enter for my doctoral studies. Kindly consider my application for admission to your PhD program with full financial support.