

Statement of Purpose

My interest in Computer Science stemmed from programming in High School, during which period I read introductory books on Algorithms by Dromey and Wirth. It was this informal literary venture that introduced me for the first time to *doing things as efficiently as possible*. I found this an intellectually stimulating exercise and resolved to pursue a career in Computer Science.

Abstract Mathematics has always fascinated me. The course work during my B.Tech. program has given me exposure to a wide range of advanced mathematical techniques and also provided an insight into Theoretical Computer Science. In particular, the concepts I acquired in Graph Theory and Complexity theory, during the courses in **Discrete Structures, Data Structures and Algorithms**, and **Theory of Computation**, have interested me immensely.

My B.Tech. Seminar included a literature survey on **Parallel and Randomized Algorithms** and my B.Tech. Project is in the area of **Graph-Drawing Algorithms**. These have given me a chance to do research in the form of proving lower bounds on efficiency of algorithms, design of graph algorithms and combinatorial approaches to planarity of graphs. It has been a wonderful first-hand experience in problem-solving, working with small examples to begin with, developing an intuition for the problem, coming up with conjectures, constructing counterexamples against them, modifying the conjectures and (if I am lucky!) proving them. The satisfaction one derives from this experience, is in my opinion, the greatest reward for research.

With the purpose of honing my mathematical background for these fields further, I have taken the elective **Algorithms and Complexity** and registered for courses in **Abstract Algebra, Combinatorial Optimization**, and **Information Theory and Coding** for the coming semester. Currently, I am also attending a lecture series on **Markov Chains** and their application in the **Uniform Generation of Matroids**.

I strongly feel that Algorithms and Complexity theory are the core subjects in Computer Science. These fields have both a mathematical flavor as well as potential for in-depth research which draws me towards them. Hence I envisage myself, a few years from now, as researching on the lines of Theoretical Computer Science, preferably in an academic environment.

I have a strong inclination towards teaching. Having delivered lectures during the Workshops and Seminars conducted by the department at the Institute level and doing a teaching assistantship for an introductory course in programming, has built in me a lot of confidence and strengthened my resolve to teach. I believe (and this has often been reinforced by my B.Tech. Project advisor) that teaching a subject is the best way to learn more about it. I would love to teach the courses in Theoretical Computer Science that I have taken during my undergraduate studies to enhance my understanding of these fields and get a better grasp on the basics.

A few years back, Theoretical Computer Science was in its incipient stage in India and the main research work was affiliated with the Mathematics department. Recently however, a lot of young post-graduates have returned to the country and are pursuing research in academic environments. IIT-Bombay and Tata Institute of Fundamental Research (TIFR), Bombay now have an excellent group in Theoretical Computer Science. I would like to come back for teaching and work as a part of this group.

I have heard from IIT Alumni and faculty about the Theoretical Computer Science department at the Stanford University. Also, my advisors have recommended the University on the basis of the faculty interests, the research done in the past, the work currently in progress, and the excellent performance of the students who have graduated from your department. In my course work and literature surveys at IIT, I have had a chance to read the publications of the faculty, especially in the field of **Approximation Algorithms** and **Parallel Algorithms**. I find that the graduate program at your University suits my interests extremely well.

I realize that the purpose I have in mind would require a constant and a well-directed effort over the years to come. It is with this mental preparation that I desire to join the Ph.D. program

at your department.

In conclusion I do hope that I will be given a fair chance to realize my objectives by being granted admission with financial aid at your institution. My academic credentials combined with my research experience and interest in the area of study that I have selected, give me the confidence to claim that if provided with such an opportunity, I would acquit myself creditably in your stimulating academic environment and thereby contribute my own mite to the academic milieu at your department.