STATEMENT OF PURPOSE

When I was in high school, I had seen mathematics just as a computational tool using clever trick to solve problems. At that time, I was so fascinated by solving problems in Mathematical Olympiad (MO) which made me involve two times in Cambodian Mathematical Olympiad (CMO), but unfortunately I did not win any prizes at the end. Having finished high school in 2013, I knew very well that I wanted to study mathematics at university. Since I came from very humble background and to respond to my passion, I had to work as a home tutor and then joined the Royal University of Phnom Penh (RUPP). Year one at RUPP, I was wrong back again since I thought I would become a CMO trainer so that I spent most of my time in the university solving MO kind problems to improve my problem solving skills. Furthermore, in 2015, there was a CIMPA seminar talk in my department and I got so ashamed that I could not understand and answer some basic questions from French speakers. During the break, I asked them for some advice and they wisely suggested me to try to teach myself all core areas in mathematics that an undergraduate should know.

What I just said might sound odd since I did a degree in mathematics at RUPP. So let me give a few example of what my mathematics courses at RUPP looked like. In year two, we had a course called Advanced Analysis, but our lecturer spent almost entire year teaching us doing indefinite integral of more than thirty forms using various tricks and methods. In Complex Analysis course, for one whole semester, we got only the basic definitions of complex integral since our lecturer wasted a lot of time on the properties of complex numbers. With this concern, beside the compulsory course works at school, I started doing self-study on some basic tools such as "Calculus" written by Michael Spivak, "Elementary Real Analysis" by Thomson-Bruckers, "Complex Analysis" by David A. Wunsch, "Contemporary Abstract Algebra" by Gallian, "Linear Algebra" by Axler Sheldon, and "Introduction to Topology" by Collin Adam. Generally, I did not finish a book completely, but I do read 80% to 90% of each text.

After my bachelor graduation in 2017, I got some offered opportunities to do my master degree in mathematics at several places. In 2018, I then chose to join a fully-funded MSc. in mathematics program at the Indian Institute of Technology (IIT), Jodhpur, India. It is one of the prestigious institutes in the country and literally the education system there is good for doing mathematics degree. From IIT Jodhpur, I have learnt many things. I have learnt ten compulsory courses: "Real Analysis", "Linear Algebra", "Abstract Algebra up to Galois Theory", "Complex Analysis", "Ordinary Differential Equations", "Partial Differential Equations", "Programming Techniques", "Numerical Analysis", "Probability and Statistics", "Functional Analysis". And also I took four elective courses: "Calculus of Variations and Integral Calculus", "Dynamical Systems", "Chaos Theory", and "Measure Theory".

Beside these 14 course works during the MSc program, I also have learned lot of things in Topology from various training schools, workshops, and seminars. Moreover, I personally used to be selected as a summer and winter intern working on the topic of Algebraic Topology under the supervision of Prof. Ashish Kumar Upadhyay and Prof. Biplab Basak at IIT Patna and IIT Delhi, respectively. With this path, I then chose to do my one-year MSc thesis at IIT Jodhpur under the guidance of Prof. V. V. M. S. Chandramouli on the topic of Algebraic Topology titled as "Some Fundamental Results and Their Applications in Algebraic Topology". It covered all the core parts of the subject Algebraic Topology. Having completed this MSc work, my advisors wisely advised me to further working on Topology and I accepted that it was my most research interests. And I know that to work on this area with a broad view, I have to learn more from Smooth Manifolds and Riemannian Manifolds. Therefore, after I graduated from my MSc degree, I immediately joined a project work on Smooth Manifolds under the supervision of Prof. Biplab Basak and this work is hopping to be finished by August 2021.

I do love and appreciate the beauty of the subject Topology. However, Topology is a huge subject and it demands computation, visualization, and a good grasp on fundamental topics in mathematics. Hence, I am passionate about exploring other branches of the subject and spending some time to learn it carefully one by one. And I do hope that these learning tools will help to push the boundary of my understanding broader and later to contribute something beautiful and meaningful in my future research work.

Now I know that I want a career as a mathematician specializing on Topology at a university. Therefore, I am looking to continue my PhD degree at the Indian Institute of Technology, shortly called IIT in which it can provides me good education and unique research experience working under the guidance of any active topologists. I am a hard-working student so I believe that I can perform well in doing research and finish my PhD degree on time. With this reason and confidence, I am requesting you to be kind enough to consider my application and accept me as a PhD student in your graduate program. I am sure that it will help me a lot; as I know I will make much better progress and produce good research works beyond the expectation.