Teaching Statement: Sushovan Majhi

Motivation

Academia is the cradle of new research and findings; there is no better place for ideas to take shape in their purest form. And, teaching is the foundation of academia. I teach and aspire to a professional teaching career, because I enjoy doing it immensely. As an academician, I perceive teaching as complementary to research, as both foster the liberty of sharing knowledge to bring about changes for the betterment of our society.

During the early stage of my student life, I mostly resorted to self-teaching, ascribing to the scarcity of competent math teachers. Such an endeavor, however, prompted me to appreciate the necessity of a good teacher, particularly in the field of mathematics. It sometimes resulted in spending long, enervating episodes to apprehend an elusive concept, however I found different ways to teach it to a student in the pursuit of teaching myself. Long before I started teaching students, I would often conceive of myself as a teacher teaching the concepts the way I wanted them to be taught to me. As I learn, so I teach. My first teaching opportunity turned up during my masters study. Since then, teaching has always been helping me understand the concepts better and express myself more eloquently. In addition, the ecstatic joy in helping students to learn new tools and concepts of mathematics sustain my relentless enthusiasm for teaching.

My early teaching career in India mostly included preparing students for competitive exams. I eventually found myself so involved in teaching mathematics that I decided to co-found a tutoring institute. Along with my six employees, I mostly aimed at teaching various tools and strategies for undergraduate calculus, analysis, and linear algebra. The company made profit, but what it yielded more in me was the desire to pursue a PhD in order to enhance both my knowledge of mathematics and teaching experience.

Courses

My teaching interest includes, but is not limited to, undergraduate courses, like *calculus*, *real analysis*, *linear algebra*, *applied mathematics*, *theory of ordinary differential equations*, *statistics*, *probability theory* etc. I also look forward to offering graduate courses, like *topology*, *analysis*, *differential geometry*, *manifold theory* etc. With a strong background and research interest in topological data analysis and computational geometry, I am also interested to teach undergraduate and graduate *data science*, *topological data analysis*, *computational geometry*, *algorithms*, and *computational complexity*.

Experience

The PhD program at Tulane university opened up a whole new spectrum of training opportunities in research and teaching. I have learned that a successful teacher knows how to look through the students' eyes. As a teaching assistant for courses, like calculus, applied mathematics, statistics, I worked closely with my students. It helped me to better understand their perspective, along with their problems and needs. Being an international student, it was an important experience to work in a very different and *diverse academic and cultural environment*. It was all put into action when I contrived an opportunity of teaching *undergraduate statistics* as a student instructor there.

Philosophy

As an instructor, I have been gauging my teaching tools and techniques on a regular basis. It is simply impossible to conjure up a unified method of teaching to account for all students' needs. However, persistent *interaction with my students* has proven to mitigate the difficulties ensued from the differences in the educational and cultural backgrounds. I follow a blend of *lecture-style* and

active-learning techniques in my class; the proportion is usually decided by the type of the course and the background of the students. The key to learning is to *get involved*, and in mathematics, *matured thinking* and *matured practice* have always been rewarded. I tend to leave enough room for both in my well-thought-out homework assignments and recitation sessions. I always encourage *active participation* of my students during the lectures. In a gesture of helping each other, *group efforts* have also been an effective way to learn the concepts better and improve relations with peers. For an example from my statistics class, some students find the central limit theorem and the concept of sampling distribution to be relatively difficult to comprehend, since it involves re-sampling the distribution. I asked the students to partake in a fun sampling game and provide me with a random sample using a random number generator. The effort finally paid off when, much to my students surprise, the histogram of their sample means turned out to be a giant bell curve on the projector.

Methods and Objectives

With the advent of modern technologies, computers and computer programs have made their passage into academia. Computer software, like Mathematica, Matlab, etc, can help students visualize theorems and build intuitions for them. Not only does the *touch of computation* delineate the concepts better, but it also provokes the *computational thinking* in students. As a coding hobbyist, I develop libraries to supplement my teaching and research. As an example, students, who are new to calculus, find the concept of limits, where an infinite process is usually imagined, to be difficult to understand. I promote the use of *computer-aided visualizations* to help students make an educated guess about the qualitative and quantitative nature of the limit.

In an effort to organize my courses, I use various *online learning platforms*, like Google Classroom, Canvas, Blackboard, Web-assign, etc, for discussions, announcements, assignments, and grading. It helps students to get engaged in learning even outside the classroom. In addition, students find it very useful to have my board pictures uploaded online for future use.

My courses are structured to attain a broad range of objectives. For more theoretical courses, like calculus, linear algebra, topology, etc, I emphasize on *logical reasoning*, *writing well-structured proofs*, etc. Exposing students to related fields of mathematics through supplementary *inter-disciplinary projects*, I help students to make up their minds not only about their major but also about their prospective professional career.

Assessment and Evaluation

Self-evaluation has become an integral part of my teaching activity. Along with paying special attention to evaluating students against the objectives of my courses, I lay out various strategies for assessing myself. Along with the final evaluation, I collect students' anonymous feedback on my teaching performance and their understanding on a monthly basis. For honest reviews, I often invite my colleagues to sit in on my class as an observer. From constructive course evaluations to demeaning criticisms posted online, I take into account every source to locate and obviate the challenges.

Being a well-trained, experienced and energetic instructor with a strong passion for teaching, I consider myself a good fit for this position. If given the opportunity with a reasonable extent of academic freedom, I will strive to ensure a conspicuous impact of my teaching on the academic success of the institute.