Teaching Statement

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My very first experience of teaching was when I was still in High School and earning some small allowance by tutoring other junior students after school. Back then, I haven't given teaching too many thoughts. But the satisfaction of seeing how other students transit from hating a difficult subject into being fascinated by the subject matter always brings me joy. My first experience of teaching in a formal setting was during my early undergraduate years. I prepared laboratory sessions and gave tutorials at several 2-3 day workshops on Linux, Java and algorithmic complexity. This was a challenging experience for me as it involved keeping the audience with varying levels of familiarity interested and engrossed. In my senior year, I taught a new course on Data Science along with Prof. Alan Fekete from U. Sydney as the popularity of applied machine learning grows in industries. I took up this task enthusiastically and taught around 18 hrs of classes every fortnight, set homework and gave exams for the course. Since the contents were relatively new, I also provided feedback throughout the semester on the assessments and course materials.

During my postgraduate years, I gave many talks at various Universities, academic conferences, and industries meetup. On one occasion, I gave a full-day tutorial on "Sampling-based Motion Planning" to a group of junior engineers. I slowly realise the differences between presenting academic ideas in conferences versus teaching new materials to students or the industry. The difference is subtle, but ultimately in teaching, we should tailor the material closer to the student's needs with gradual transitions. When I am working in my lab with my fellow peers, I enjoy posing random questions and ideas to my colleagues as it always helps to refresh my mind. Whenever we study too in-depth on a problem setup, we might miss the bigger picture or fail to view it from a different perspective. Rather than posing the teaching materials to students in an overly theoretical formulation, I often link the institutions of the various machine learning methods with daily relatable examples. Moreover, I learned so much more when I bluntly ask fundamental questions that are often omitted from textbooks/lectures. This also helps me to provide initiative explanations to students whenever they are strugglings with their studies. I believe University is a place for us to facilitate discussion among scholars regardless of their experiences. I often encourage constructive criticisms by both instructors and students so that we can learn and experience how one can be both a teacher and a student simultaneously.

I have always enjoyed learning about how the world works and even enjoyed dissembling objects to fully understand their inner workings (whether I can reassemble them later is of a different story). I believe the learning process should allow students to understand the fundamental concepts and apply them under different contexts. I taught introductory undergraduate-level

courses such as computer science's "*Introduction to Programming*" and "*Data Structure*" and "*Informatics: Data and Computation*" for machine learning techniques. For advanced and post-graduate courses, I had taught "*Algorithm and Complexity*", "*Programming Language and Paradigm*" and the practical "*Capstone Project*" in their final year.

I can teach a broad set of courses, in the area of Algorithms, Automata, Computer Architecture, Databases, Programming Languages, Networking and Probability at the undergraduate level. At the graduate level, I can teach a number of standard networking courses such as Algorithmic Complexity, Artificial Intelligence Algorithms, Distributed Systems, Machine Learning, Computer Vision and advanced topics in related areas. In addition, I intend to introduce the following new advanced graduate level classes.

- **Robotics, Motion Planning & Control Theory:** I shall build upon prior experiences that I have gained on my research and publications. I intend to further develop this course by focusing on recent advances in robotics research, sampling-based motion planning and theoretical guarantees in algorithmic design. In particular, I will provide an interdisciplinary overview of computer science, control theory, and engineering branches. Robotics involves the design, construction and operation. In contrast to existing courses in Mechatronics, this course will focus on the operational side of autonomous robots, such as manipulation and autonomous driving.

- **Machine Intelligence & Probabilistic Theory:** I intend to carefully develop this course, which would expose students to the fundamental principles used in Machine Learning and Deep Learning. This course will expose students to mathematical techniques borrowed from a number of areas in Statistical Analysis and Probability Theory. However, this course will differ from several previously offered courses by focusing on linking the underlying probability theory with Deep Learning and Neural Network architecture. In the coming years, this course will also expose students to model designing, reliability and optimisation theory, which will become increasingly important.

I believe that universities have an essential social responsibility of training and mentoring students to have "open minds" and to think rationally. The most fascinating attribute about knowledge is that it does not discriminate against people based on appearance, ethnics, gender, believes, social status and social background. I believe knowledge and education help to facilitate conversion across the Sociological construct of boundaries imposed by society, and it offers equal opportunity to everyone on social equity. Teaching and mentoring allow me to understand, learn, and mould young minds to the more significant cause—the betterment of science and humanity. That sums up my primary motivation for pursuing an academic position.