TEACHING STATEMENT

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In the knapsack of a traveller in this increasingly computerized era, a solid entry-level training is his map and dictionary, the ability of problem solving enables him to surmount obstacles, and it is the spirit of exploring that makes him to discover the unknown world and change the known universe. My teaching philosophy for computer science emphasizes three aspects: the education of core concepts and principles of information science, the training of the ability to identify and solve interesting real-life problems, and the cultivation of the passion for research and practice.

A first task of teaching is to offer the students a solid understanding of core concepts and techniques, the cornerstones of computer science. While learning by remembering is only a first step, applying the knowledge to real-life applications fulfills the understanding. During my study at Edinburgh, I was able to exercise my methodologies by co-tutoring two database courses: Advanced Topics in Web Databases (QSX), which introduces XML and graph data, and Research Topics in Distributed Databases (TDD), which covers basic and advanced techniques in distributed data management and data quality. Most students stoped at remembering the concepts, for example, semi-structured data query languages, and had trouble on truly understanding their rationale and application. To complement both courses, I designed discussion groups involving paper reviewing, discussing and debating. I encouraged my students to present in their own words, for example, real-life XML and graph data, and the killer applications expressible by searching languages. I also let students to debate as database designers on query language features, which leads them to active thinking on designing principles. This greatly helped them to understand and apply the concepts and techniques they have learned. Inspired by the discussion, some students have creatively developed new querying and processing techniques during their internship in companies.

As a problem-solving field, computer science requires skills to give feasible solutions, as well as a good taste for interesting problems with impact. While the former can be trained by, e.g., course projects, the latter relies on the development of long-term critical thinking and effective cooperative learning. In TDD and QSX courses, research directions are assigned to groups (each contains 3 students). I helped the students to effectively collaborate according to their specialists, and guided them on identifying promising research topics. To encourage critical thinking, I also guided inter-group communication and collaboration. This gives students the chance to examine the techniques used for other projects: by effective collaboration, two groups studying view maintenance of XML queries and XML view updates both deliver promising results. I have also supervised two master students, Saad and Yi, for their graduation research projects. For individual student, my training cycle focus on independent research skills including finding nice research topics, writing, coding and presentation. During my supervision of research master students at Edinburgh, I carefully led my students to go through complete research cycles, and provide guidance according to his or her weakness and intellectual comfort zone. The project-based training greatly benefits individual students to conduct research independently.

Education of scientific skills is not the only goal: it is the cultivation of passionate mind for computer science that makes students eager to explore. During my teaching, I always encourag my students to keep their mind open, and to explore the unknown and change the world with their knowledge. In INSET program of UCSB which aims to introduce entry-level research education, I mentored Juan, an undergraduate intern. The student feels frustrated on his plan to complete the program. During the communication, I found that he has background and particular interests on social network analysis. Starting from here, I inspired him on social querying through several fine-grained research topics, and we decide to build a social graph querying and visualization framework. Motivated by the interesting problem, he is excited at the project and has identified more research topics. He completed the work independently with a nice interface and server-client structure, which is highly recommended at the INSET seminar and introduced at SACNAS conference. Juan enjoys the research process, and shows a great passion for exploring more in his future graduate study. He aims to pursue a master degree in computer science and starts his innovation company.

My past teaching experience is a wonderful journey for my students and me. I have not been granted for teaching awards, while I consider the greeting cards and thank-you notes I received from my past students as my best rewards. My enthusiasm for introducing computer science to more students and my past experience means that I would enjoy teaching introductory courses including data structures, algorithms, databases, data mining and machine learning. My research backgrounds strongly equips me for teaching advanced courses in databases, graph mining, computational complexity theory, and related topics. By applying my teaching methodologies while making a strong integration with the curriculum of the department, my goal is to let every student in my classroom to become a great traveller in the age of information, equipped with solid skills and a keen, passionate mind to make life better using their knowledge.