

TEACHING STATEMENT

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Teaching and mentoring students are an essential part of academic life, and my passion in teaching drives me to pursue an academic career. Teaching fundamental concepts to students in a simple way can effectively foster their interest and curiosity in the subject. What's more, teaching also facilitates research. The teaching process can lead me to a deeper and novel understanding of certain topics, and will bring about new insightful discoveries in my research. In addition to teaching, an academic position also provides me with the opportunity to mentor and work closely with students. Junior students, with a fresh bent of mind, can think about problems freely and creatively outside the box. Knowledge and idea exchange in both teaching and mentoring junior students can often lead to amazing academic insights. In the past years, my experiences as an assistant professor have shaped my teaching and mentoring philosophy. I will provide a sample of them below.

A. Teaching Experience

A.1 Graduate Course Instructor: Recently, in the Spring Semester of 2018, I worked as the *instructor* of an advanced graduate level course, *CIS 5930-0004: Social Network Mining*. Different from the basic introductory courses for undergraduate students, this course is designed for graduate students, especially PhD students, with background in data mining specifically. The goal of this course is to show the recent data mining research developments to the students, and teach the students to read and write academic papers in this field. This course is a seminar style course, which focuses on selective areas of importance in social network mining, data mining and machine learning. Different from the other courses offered at Florida State University, in this course, students play the central role and they need to read and present papers to the other students in class. In addition, the students also need to write an academic paper based on the papers they are interested in by the end of the semester.

In this course, I'm responsible for (1) giving introductory talks about certain research topics, like machine learning, deep neural networks and online social networks, (2) preparing the list of academic papers published in recent years, (3) hosting the weekly in-class presentations and group discussions, (4) organizing the schedule by inviting students and scholars to present recent data mining research works in each class, (5) grading the final course papers in terms of their novelty and technical contributions. The experiences gained from this class by working and discussing with students on frontier research problems is totally different from the other courses. To ensure everyone can benefit from the course, for junior students I need to review the development line of research that leads to the current technological innovations, while for senior students and scholars, I need to point out the specific strength and drawbacks of each presented paper to motivate their new research ideas.

Students like this course a lot, and according to the student evaluation by the end of semester, I achieved a score of 4.55/5.0 (i.e., *Excellent*) from the students for this course. It is a huge encouragement for me as a junior faculty. I also received valuable suggestions from the students, which are helpful for improving of the course to make it a preferred course among the students.

A.2 Undergraduate Course Instructor: Delivering lectures for undergraduate students is one of the most exciting and challenging parts in teaching. Explaining problems, concepts and approaches in a concise and systematic way will make it much easier for junior students to digest the details and construct their own knowledge networks. During the Fall Semester of 2018, I'm working as the instructor to teach an undergraduate course, *COP 4710-0001 Database*, in Florida State University. It is an introductory course for database, and the student need to study the fundamentals of relational database management systems. This course is challenging to teach because of not only the diverse course contents to be covered but also the large class size (75 undergraduate students).

The course needs to cover a lot of topics, and I try very hard to connect them together. For instance, the course starts with the ER model, which will transit to the relational data model; then we cover the algebraic language in the relational data model and its relationship to the SQL language; afterwards, the course also introduces some basic information about database design, applications, indexing, transaction management, recovery and other advanced topics.

Meanwhile, to attract the attention of the students, besides some in-class quizzes, I like to raise some open questions for the students to discuss in groups, like "How to design the ER model for a e-commerce website, like Amazon?", "How to create the tables to store Google Maps data?", and "How to do ER model fusion if we need to combine multiple tables?". Furthermore, to help the students use the learned knowledge in real-world applications. In this course, the students will participate in a semester-long project and build a web-based database system (e.g., an online bookstore) starting with a customer specification.

According to the feedbacks received from the students by this context so far, they could grasp the key knowledge points very well and make the topic transitions smoothly. In addition, most of them feel excited about the course project and many plan to create a startup based on the project demo.

A.3 Teaching Philosophy: Based on the experiences in teaching and mentoring students, my teaching philosophy comes from several dimensions,

- *Individualization based Teaching:* When teaching students of diverse academic backgrounds, according to the students' particular levels of expertise, the presenting approach and materials need to be calibrated correspondingly to ensure the ideas are easy to digest. Individualization is extremely fundamental in teaching.
- *Active Learning based Teaching:* I think fostering passion is the most important duty of a teacher. Motivating students to bring about their inspiration and curiosity into independent active learning is the ultimate goal of teaching.
- *Hands-on Projects based Teaching:* "Learning from doing" is my own study and research motto. Based on my own experiences, new problems can always be discovered when going deep to implement the models/systems. Teaching with hands-on projects can usually achieve a remarkable success.

B. Example Courses

I am interested in teaching courses related to the newly evolving inter-disciplinary areas of *Computational Social Science*, *Data Mining* and *Advanced Large-Scale Data Mining*. The following are the brief goals of these three courses:

- *Computational Social Science* (lecture for undergraduate and graduate): An inter-discipline introductory course of social science and computer science. This course focuses on seeking solutions to problems that are motivated by sociological observations underlying our daily life. The approach to addressing these problems will be largely computational, utilizing robust scalable tools/methods and reliable sociological data.
- *Data Mining* (lecture for graduate): A principal course introducing problems, methods, algorithms and applications in data mining. The goal of this course is to equip the students with basic knowledge about data mining. A couple of course projects will be designed to help students to get familiar with real-world data mining problems, approaches and tools.
- *Advanced Large-Scale Data Mining* (seminar for graduate): An advanced course on recent data mining research breakthrough works. The goal of this course is to show the data mining research frontiers, and motivate students to push the knowledge boundary (of data mining) further forward with their own research works. A variety of recent promising data mining topics will be covered in this course, such as scalable data mining, deep learning, social media/science, recommender systems, urban computing, crowdsourcing, etc.

C. Student Mentoring & Advising

C.1 Student Mentoring Experience: I have mentored many PhD/master/undergrad/high school students, among whom two students have finished their PhD degree and find faculty jobs in the academia. Some of my mentoring experiences include:

Qianyi Zhan (PhD, Now: Assistant Professor at Jiangnan University): I started to mentor Qianyi Zhan since September 2014 until August 2016, and our works mainly focus on information diffusion across online social networks. We have 11 collaborated papers published at top tier conferences/journals, and Qianyi is an Assistant Professor at Jiangnan University now.

Junxing Zhu (PhD, Now: Assistant Professor at NUDT): I mentored Junxing Zhu during 2015-2016, and currently we have 4 collaborated papers published. Our prior works mainly focus on entity alignment across social media. After finishing his PhD degree, Junxing has been employed as an Assistant Professor at the National University of Defense Technology currently.

Yuxiang Ren (PhD Student@IFM Lab, FSU): Yuxiang joins the IFM Lab in FSU in 2018 Spring, and has been working on projects about social network alignment and fraud detection. Yuxiang has finished and submitted 3 academic papers already.

Lin Meng (PhD Student@IFM Lab, FSU): Lin joins the IFM Lab in 2018 Fall, and has been working on a project about network embedding. Currently, Lin has finished 2 papers which will be submitted to WWW and ICDE conferences.

Jiyang Bai (PhD Student@IFM Lab, FSU): Jiyang joins the IFM Lab in 2018 Fall, and focuses on papers about optimization and tensor decomposition. Jiyang has finished 1 paper and starts to work on his second paper on optimization.

C.2 Student Mentoring Philosophy: An advisor's ultimate role is to help students gain the necessary expertise to carry out their independent research. According to my past experiences, I summarize several key points in mentoring as follows:

- *Bold Thinking:* Young graduate students with limited experiences can actually think very freely, which can sometimes trigger amazing research ideas and lead to exciting discoveries. Bold thinking can foster the passion and creativity of students, and help them discover what they are really interested in.
- *Free Exploration:* Few students can learn the skills of research without tries and mistakes. When students come up with new ideas, I will encourage them to explore and check the ideas with simple experiments. In the process of exploration, students can gain invaluable research experiences and deeper understanding about the problems.
- *Uncompromising Support:* The research exploration of students never lacks of puzzle, failure, frustration and helplessness. As the advisor, I will always stand with the students along the way whenever they turn to me for help. By cooperating with the students, they will eventually overcome the problems and achieve great success in the projects.