Teaching Statement

I believe that the main goal of education is to boost student’s capabilities of critical thinking and problem solving, in particular, in the field of computer and information sciences, the process of design and implementation process of any software or system is just a process of critical thinking and problem-solving process. The perspective employers expect our graduates to have these capabilities. I assign a comprehensive course project for each course I teach and allocate precious contact hours to guide students to approach multiple solution options and evaluate these solution options by analyzing pros and cons using critical-thinking techniques.

But I believe critical-thinking and problem-solving should be based on solid fundamental knowledge of subjects. Without extensive vocabulary of terminologies, a student even can not do an effective google search. Without basic skills, a student can not pass coding tests given by potential employers. Without solid knowledge of a subject, a student can not come out multiple solution options of a course project, and without basic skills, a student can not implement a project design and solve the problem completely. Without solid fundamental knowledge and skills, our undergraduate students have few chance to pass GRE Subject Test to attend good graduate schools.

I understand that, given limited course hours, I can teach students basic concepts, terminologies, multiple solutions to classical problems, as well as techniques of critical- thinking only if I adopt effective teaching methods. To this end, I use many teaching techniques such as the alignment of learning objectives and assignments, engaging students in discussion, parity or grouping of students for class activities, instant feedback, using grading rubrics, etc.

The effectiveness of teaching methods above has been proved by many experienced professionals, but it is not easy to implement, in particular, for large classes. I believe that technologies are the key to implement these teaching methods. For example, I emphasize on assignments as much as classroom learning in my teaching , which are important to the course assessment and make students think I am a serious instructor. However, I know that I can not distribute too much time to grade massive amount of assignments, otherwise I have shorter time left for other teaching tasks such as preparation of lectures. To solve this problem, I have developed an assignment assistant, which is a component in my web-based Teaching and Learning Management system (see https://zhongyanlin.github.io/site/), to automate grading. The grading details of great amount of assignments generate big data allowing me to do solid course assessments and fair evaluations of student’s performances.

To get feedback of my lectures as quick as possible, I develop a mobile app that scans and grade automatically handwritten answer sheets of quizzes (see <https://zhongyanlin.github.io/site/grading/>). For courses that allows students to bring their own mobile devices to the class, I developed a web-based instant feedback component and mobile app (see https://zhongyanlin.github.io/site/response/) that collect student’s answers to my instant questions and display data showing the quality of teaching and learning instantly. In the old class setting, we can not precisely measure the class participation, but with these mobile and web technologies, we can do that. This also encourages students to participate in class discussions because all their responses are recorded.

With the rapid expanding of knowledge in computer and information sciences, we need to teach more and more topics. We can do that only by using technologies. For example, I developed a sorting demo for my data structure and algorithm course. It is an animated demonstration and performance tests of classical sorting algorithms and their variants (<https://zhongyanlin.github.io/site/sortdemo/>). This teaching tool allows me to cover classical topics in shorter time in order to have time to teach new topics such as hashing algorithms.

I also developed CSS editor, Javascript parser and Java Database Access objects for my sequence of web design and implementation courses. (https://zhongyanlin.github.io/site/)

To prepare effective lectures, I developed a wed front-end application called “Maneuverable Showcase” (<https://zhongyanlin.github.io/site/showcase/>), which is like PPT, but supports instant scientific notations and animations.

For teaching administration, I developed both desktop and mobile app versions of attendance management, and utility program for Blackboard integration. All of these can be found at <https://zhongyanlin.github.io/site/>

I also use existing technologies developed by various companies. For example, I use interactive online textbooks from zybooks and many content management systems and online compilation systems.

In conclusion, I pay great attention to teaching using technologies, be able to develop new technologies and be willing to use updated technologies offered from other parties as well. I wish to have opportunities to implement some teaching models or methods developed by other teaching experts at college level or K-12 levels, using technologies I have developed.