Teaching statement

Every student has his/her unique potential for further development, and I believe a good teacher is critical for cultivating the students' capabilities so that they blossom into full intellectual bloom. Different students have different learning styles: some prefer to learn through listening and taking notes, some love to have hands-on experience, while other students require communication to clarify ideas. A good teacher should be able to realize these differences and utilize them for effective teaching. An approach to achieve this is to gather different types of students on one team, encourage those with good communication skills to start the brainstorming session, recommend students good at taking notes organize ideas and present summaries of the discussion, and encourage students with good experiment skills to design experiments and test their ideas. In that way, everyone will realize their uniqueness, and gradually develop their confidence in their skills. In my opinion, cultivating students' skills and confidence is crucial for their self-motivation and academic success.

In my future teaching/advising, I plan to adjust my interactions with students according to their unique capabilities to make the learning procedures more effective. Before I start a course, I will ask each student to submit a background description and a wish list specifying what he or she hopes to achieve in my course. Based on this, I will add introductory materials if most students have little background about a specific topic and are interested in it, and design assignments to help them explore real-world cases relevant to their interests. By commenting their assignments, I will guide students to adapt their skills for different scenarios. At the same time, they can identify the gaps in their knowledge while running into any difficulties, and actively fill those gaps. I believe such an active process is an efficient method of teaching, and makes the student-teacher interaction enjoyable.

Offering customized and appropriate guidance to a variety of student is challenging, and requires a teacher to be very knowledgeable and sensitive to subtle differences among students. My experience makes me an excellent candidate for this task. During my undergraduate studies, I developed my background in bridge and structure engineering in the best civil engineering program in China; my master's research was on ontological engineering and automatic design of bridges. During my PhD studies, I developed skills in data analysis, knowledge management, construction surveying, imaging processing, and scientific workflow. Being exposed to a variety of theories and real-world projects, I

have worked in various environments with different people. These experiences qualify me as a knowledgeable mentor, who can provide helpful advice to a variety of students. From October 2007 to September 2008, I have mentored two undergraduate students in conducting several research projects for one year. Under my direction, they conducted a series of experiments investigating the accuracy of 3D data, and developed a set of tools for 3D data processing. I am submitting two journal papers reporting the results of their work under my supervision.

My teaching and service experiences also show that my personality is suitable to be a teacher. I have been a TA for two courses (Engineering Economics, and AutoCAD) at Carnegie Mellon for three years. The former enrolls 45 students every year, and the latter enrolls 20 students every year. For these students (more than 200 in total), I hold regular office hours for them, grade their assignments. Most students are positive about my approach to answering their questions; in many cases, I can identify critical points and generate ideas to stimulate their interests about the course.

My teaching interests mainly lie in infrastructure management and construction management. For undergraduate students, I am able to offer introductory courses about infrastructure condition assessment and maintenance, construction and project management, and engineering economics. For graduates or senior undergraduates, I can teach advanced versions of these courses with a focus on how to utilize information technology (e.g. data management, multimedia data processing, knowledge based system, etc.) to develop solutions for supporting the daily decisions of civil engineers. I am knowledgeable about various commercial/open sources packages useful for civil engineers (e.g. SciPy, MATLAB, AutoCAD), and I plan to integrate such knowledge into my future courses and encourage students to quickly implement prototypes based on existing tools for showing their problem-solving approaches. In addition, based on my expertise, I want to develop a new course related to automated visual data interpretation for construction and infrastructure management, which might be a graduate level course for students who are taking or have taken one or more courses related to construction management and infrastructure management.

The most important measure of the success of my career is how successful my students are. I want to take on this challenging and rewarding task, sharing my knowledge and experiences with students, which is the most important reason motivating me to become a professor.