Teaching Statement
Changhong Zhao

I was fortunate to have many great teachers in the past twenty years. Their time and effort have significantly changed my life, and their passion and professionalism have motivated my interest in an academic career. Being a good teacher myself is probably the best way to repay.

From my own experience as a student and a teaching assistant, I believe that teaching is not simply to convey knowledge and skills to students, but more importantly to help them develop independent learning, critical thinking, and creative problem-solving. I will carry out the following principles to reflect this belief. (i) Prepare courses with well structured syllabuses and clearly written lecture notes. Based on the backgrounds of students, I will decide the most relevant subjects to cover, and the most appropriate balance between theory and application, concepts and details, and intuitions and mathematics. (ii) Motivate active learning. I will interact with students enthusiastically in the lectures and encourage them to ask questions. I will also challenge the students with bonus exercises, which may require readings beyond the textbooks and notes. (iii) Guide students to discover and develop their own potential. Course projects and research in the labs are great motivational tools for this purpose.

Experience: I have served as a teaching assistant for two courses: Ideas behind the Web, and Communication Networks (twice). The online reviews from students were 4.33, 4.80 and 5.00 out of 5 (Caltech average was around 4.25). My duties included designing and grading homework sets, holding weekly office hours, and giving a couple of lectures. Both courses feature a harmonic combination of real world applications and the theories underlying them: from web search, routing, and advertising to graph theory, probability, and game theory; from the layered architecture of Internet to network dynamics and optimization. This was an appealing and rewarding experience, which has shaped my ideas on how to teach in an interdisciplinary field.

Courses: I am competent and strongly interested in teaching the following courses both at the undergraduate and graduate levels:

- **Power systems**, which will cover phasor representation, modeling of lines, transformers, and generators, power flow analysis and optimization, power system dynamics and stability, and voltage and frequency control. The textbook would be “Power Systems Analysis” by A. R. Bergen and V. Vittal.

- **Control theory**, which will include linear systems, Lyapunov stability, state and output feedback, transfer functions, frequency domain analysis, and optimal control. I will use “Feedback Systems: An Introduction for Scientists and Engineers” by K. J. Åström and R. M. Murray as the textbook, complemented with my own notes.

- **Convex optimization**, which will focus on convex sets, functions, and programmings, duality, and optimization algorithms. Example applications in machine learning, signal processing, and control will be covered throughout the course. The book “Convex Optimization” by S. Boyd and L. Vandenberghe would be an ideal textbook.

In addition, by zooming into a few topics from the courses above, I plan to design advanced courses such as **nonlinear systems**, **networked control systems**, and **distributed control and optimization**. These advanced courses may involve research activities like literature reviews, student presentations, and guest seminars. Moreover, I would love to teach **computer networks**, **probability and statistics**, **stochastic processes**, and **signals and systems**. My courses are likely to attract students from electrical engineering, systems engineering, mechanical engineering, computer science, applied mathematics, et cetera.