TEACHING STATEMENT

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Teaching is a privilege. I am passionate about sharing my knowledge and my own understanding of the subjects I am familiar with, such as information theory and wireless communications, with students. I view teaching as a rewarding intellectual activity which not only helps students to understand a new field, but also helps to refresh and improve my own understanding of the subject. This makes the opportunity to teach and work with students one of my main motivations to pursue a career in academia. I also view teaching as a key responsibility of a faculty member. As the process of transferring existing knowledge to students and inspiring them to explore further, teaching is the only way to maintain knowledge and technology advancement as a sustainable process.

Although still relatively inexperienced in giving lectures, I have had the chance to learn from several wonderful lecturers during my undergraduate, postgraduate, and postdoctoral studies. Their ways of teaching have made a great impact on the way that I plan to teach. Many subjects in electrical engineering are rather mathematical, which would be difficult and boring to students if not taught in a proper manner. Fortunately, my experience was the opposite. I enjoyed lectures carefully designed with simple and insightful examples that guided us through the painful process of understanding the underlying mathematical details. In addition, the importance and relevance of the subject were constantly emphasized by my lecturers through relating it to real world examples or relevant research topics. In such a way, students were well motivated after realizing the usefulness of the subject. Hence, my key principles of teaching consist of two: 1) Teach with the aid of simple and insightful examples, helping the students develop interests and confidence in the subject; 2) Keep motivating the students by constantly emphasizing the importance and relevance of the subject to the real world. Besides the above, a well designed course structure with well prepared course materials, and clear presentation are definitely of first priority.

In terms of one-on-one interaction with the students, I am lucky to have been given opportunities to guide three undergraduate students through their honor year projects when I was a graduate student, and to guide two Ph.D. candidates on their research currently. These experiences have been rewarding and fruitful, from which I learned that studying together with the students patiently in the initial stage is crucial to build their confidence. In addition, constantly encouraging and challenging them to overcome difficulties by themselves will then gradually develop them into independent researchers. These are the general principles that I would like to apply to guide my own future graduate students.

With my solid background in the areas of information theory and wireless communications, I will be comfortable teaching most of the related undergraduate- or graduate-level courses in these two areas, which include but are not limited to:

1. **Basic Information Theory.** This is a basic course on information theory, which aims to help the student understand the foundation of digital communications. Concepts of noiseless source coding, channel coding, capacity of a channel, and rate distortion (lossy compression) are covered.

2. **Digital Communications.** This course aims to help the students understand how digital communication systems work and how to analyze the performance of certain digital communication systems.
3. **Error Control Coding.** Both conventional and modern error correcting codes are covered. The students will study the performance, complexity, and other characteristics of the individual channel codes, and learn how to apply them in different communication scenarios.

4. **Probability and Stochastic Processes.** This is an introductory course on probability and stochastic processes, to equip the students with the basic mathematical tools for them to work on topics in communications and computer networks.

I am also interested in developing a few advanced courses:

1. **Network Information Theory.** This advanced course aims to help the graduate students who wish to research on information theory gain an in-depth understanding of the subject. The network or multi-user information theory is the focus of this class.

2. **Modern Coding Theory.** This course mainly covers design and performance analysis of most of the modern codes that emerged in recently years, such as turbo codes, LDPC codes, RA codes, and Polar codes.

Furthermore, I am willing to develop a new course based on my own research work and other related contemporary research results:

1. **Cooperative and Cognitive Wireless Communications.** Main topics to be covered include the relay channel, relay networks, the interference channel, and the cognitive radio channel. Both information theoretic and communication theoretic aspects of these channels will be included.