

# SEMINAR NOTICE

Department of Electrical and Systems Engineering

## QUANTUM MULTI-CHANNEL DECOUPLING

DSc Preliminary Research Examination

**Pei-Lan Liu**

DSc Candidate

Department of Electrical and Systems Engineering

Washington University in St. Louis

**Abstract:** In the beginning of the 21st century, researchers were facing new problems in micro physical world. The characteristics in micro world are much different from the macro world. Therefore, researchers developed a brand new theory called quantum mechanics to explain these characteristics. After achieving deeper understanding of Quantum mechanics, researchers aim to control the quantum system. The quantum system is in infinite-dimensional space. However, researchers have successful put the infinite-dimensional quantum theory into a analytic domain which we can easily adapt the modern control theory to.

We work on a quantum multi-channel system in analytic domain and explore the decoupling problem which facilitated the design of quantum network. We provides a feedback control law to change the structure of quantum system and made one output channel affected only by one input channel. We also discuss in which conditions we can achieve quantum decoupling. We use the physical systems as examples to illustrate the quantum decoupling problem

DATE: Friday, May 6, 2011  
TIME: 10:00 a.m.  
PLACE: Bryan Hall, Room 305

Thesis advisor:  
Dr. Tzyh-Jong Tarn

This seminar is in partial fulfillment  
of the Doctor of Science degree