



**The Graduate School in Electronics
Telecommunications and Automation**

Selected Topics of Mobile Communication, (3 cr)
Also included: Case Wireless ECG
October, 20 – 22, 2010

Lecturer: Prof Jiao Bingli, Peking University

Bio & recent Research Interests:

Prof. Jiao received Dr. degree in University of Saarland in 1995, and he has worked as a full Professor in Peking University since 2000. Now, he is the director of institute of communication and signal processing, Peking University, and a committee member of Chinese mobile communication society. His research interests are mainly on physical layer of wireless communication system. His research work includes Multiple Access Techniques, adaptive filter, MIMO and systems of Telemedicine. So far, he has published more than 50 papers in IEEE Journals and conferences.

Course I: An intuitive understanding of spatial diversity

This course gives the physical insights of wireless fading channels. The Rayleigh fading channel is discussed for its effects on instantaneous signal to noise ratio (SNR) and the statistic behaviors.

The principle of diversity techniques is explained in two examples; (1) spatial selective diversity and (2) multipath diversity (RAKE receiver). Finally, the precondition of the spatial diversity of CDMA 2000 is discussed.

Course II: Smart antenna and MIMO

The linear array and circular antenna array are described for their functions of beamforming. The principle of interference cancelation is presented in a two array system. The adaptive algorithm of recursive least square (RLS) is derived for its use to smart antenna of CDMA system. Finally, an intuitive understanding of MIMO is given.

Course III: Research on wireless ECG

At first, we introduce the recent developments of wireless-health-care systems in China. Second, we focus on the researches of wireless ECG supported by the joint project of Finland and China. Finally, we explain a core technique, called HHT algorithm, for its application to signal processing of ECG.

Schedule:

Wednesday Oct 20, lecture hall S3, 12 – 16.00, **Thursday** I346 10 – 16,

Friday E110, 10 – 16

Venue: Aalto University, Department of Electronics, Telecommunications and Automation
Otakaari 5 A, Espoo

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