

# Multiuser MIMO Tutorial

Jointly organised by the FP6-IST projects



and



TechGate, Vienna, Austria

February 28<sup>th</sup> – March 2<sup>nd</sup>, 2007

in connection with the ITG/IEEE Workshop on Smart Antennas 2007

<http://www.ist-mascot.org/wsa2007/>

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## Announcement

The wireless industry has started to integrate single-user MIMO techniques into existing multi-user cellular standards and to define new cellular standards based on MIMO. The goal of this tutorial is to highlight, exemplify, and discuss concepts and techniques for multi-user MIMO communications both in cellular networks and in ad-hoc mode. This tutorial will cover recent advances in multi-user MIMO techniques on the physical-, medium access-, and radio link control layers.

# Multiuser MIMO Tutorial Programme

**Wednesday February 28, 2007**

Wed 09:00-10:30 Gerald Matz and Thomas Zemen:  
MIMO basics, multiplexing-diversity tradeoff, capacity of wireless channels:  
ergodic capacity, outage capacity

Wed 10:45-11:30 Helmut Bölcskei:  
Multiuser capacity and opportunistic communication

Wed 11:45-12:30 Helmut Bölcskei:  
MIMO multiuser basics, multiple-access schemes, and multi-user space-time  
coding

Wed 14:00-14:45 Jialai Weng and Giorgio Taricco:  
Multi-User MIMO Sum-Rate Capacity Optimization Based on Iterative Water-  
Filling

Wed 15:00-15:45 Ari Hottinen:  
Channel-aware multi-antenna multi-user relay networks

Wed 16:00-16:45 Antonio Fasano and Sergio Barbarossa:  
Information lossless space-time coding for multiple access systems

**Thursday March 1, 2007**

Thu 09:00-10:30 Emanuele Viterbo:  
Algebraic tools for code design in MIMO systems

Thu 10:45-11:30 Martin Schubert and Holger Boche:  
Resource Allocation and Interference Functions

Thu 11:45-12:30 Eduard Calvo/Javier Fonollosa:  
Resource allocation in OFDMA broadcast channels

Thu 14:00-14:45 Ezio Biglieri:  
Using random-set theory for multiuser detection and neighbor discovery on  
wireless networks

Thu 15:00-15:45 Daniel Figueiredo:  
MIMO multiuser OFDMA link and system performance

Thu 16:00-16:45 Alba Pagès/Luis Garcia/Javier Fonollosa:  
Minimum BER Linear MIMO Transceiver Design

**Friday March 2, 2007**

**Fri 09:00-10:30 Andreas Burg:**

VLSI Implementation of MIMO systems

**Fri 10:45-11:30 Christoph Mecklenbräuker et al.:**

MU-MIMO scheme performance evaluations using measured channels in specific environments

**Fri 11:45-12:30 Gerald Matz and Dominik Seethaler:**

Multi-antenna broadcast precoding

### **List of Contributors**

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