

## **Advanced Mobile App Development: a practical by-example course - Prof. Andrea Prati**

Short program

The course will introduce briefly and using a by-example paradigm the development of advanced Android mobile Apps. The course will focus on building Apps which make use of the sensors of the mobile devices (camera, accelerometer, gyroscope, etc.), rather than focusing on the GUI. The course will introduce the basic concepts by developing step-by-step a game-based application. Practical sessions will represent a consistent part of the course, where students will develop a given application. A final context among the students is foreseen as final event/evaluation of the course.

When: Tuesdays and Wednesdays 4 p.m.-6 p.m. from 28/11 till 20/12

Where: Sala riunioni palazzina 1

## **Multiuser Information Theory with Applications to Wireless Networks - Prof. Giuseppe Caire**

Short program

- 1) Quick review of fundamental information theory results (assuming that all students had already a basic course in info theory .. Cover-Thomas style);
- 2) Basic one-hop network communication scenarios: MAC, BC, IC
- 3) The MAC capacity region, and its application to MIMO-MAC (vector-Gaussian case)
- 4) The BC capacity region, and its application to MIMO-BC (vector-Gaussian case)
- 5) Optimization problems on MIMO-MAC and MIMO-BC, in particular exploiting uplink-downlink duality (e.g., optimal joint power control and user scheduling)
- 6) The IC .... some general results (here the capacity region is unknown), and in particular for the Gaussian IC, the optimality of treating interference as noise
- 7) Optimization on the Gaussian IC under the treating interference as noise (TIN) framework: joint link scheduling and power control.

When: March 2018

Where: to be defined

## More courses which can be followed by the students

### **Quantum Information**

Subdivided into three parts which can be independently taken by the students:

- *Introduction to Quantum Mechanics* (8 ore), prof. Sandro Wimberger
- *Introduction to Quantum Information Processing* (8 ore), part of the course "Magnetismo e Computazione Quantistica" (LMF), prof. Stefano Carretta
- *Quantum Algorithms and Protocols* (8 ore), part of the course "Sistemi di Elaborazione" (LMI), prof. Michele Amoretti

When: between March and June

Where: to be defined