

Summer Study Abroad Course on Computer Engineering: “Networks, Multimedia and Security”

by Prof. Antoni Martínez

This course consists on a 3–weeks (60 hours) intensive academic training on three key topics: Networks, Multimedia and Security

The methodology in this course will consist on four-hour training sessions, combining both theoretical and practical lessons in the lab.

Practical exercises will be proposed to the students in order to complement their training and for evaluating their academic progress.

Course on Networks, Multimedia and Security (3 weeks, 60 hours)

Syllabus

Part 1: Computer Networks and Websites

Session 1.1

Lecture: Overview of Internet and its Applications

- Structure of the Internet
- IP addresses and ports
- TCP/IP protocols
- DNS, email and HTTP

Practice: Use of a network sniffer

Session 1.2

Lecture: Basic website building

- HTML basics
- CSS basics
- PHP: sessions and authentication

Session 1.3

Practice: Enabling Internet Servers

Practice: Website building

Session 1.4

Presentations on a selected topic (students will make a presentation on the week’s activities or another topic proposed by the professor)

Part 2: Computer Security

Session 2.1

Lecture: Cryptography and Information Security

- Data Security
- Public-key cryptography

Session 2.2

Lecture: Network Security

- Attacks to computers and networks
- Firewalls
- Intrusion Detection Systems

Practice: Network Firewalls

Session 2.3

Lecture: Public-key certificates

Practice: Secure Internet Servers

Session 2.4

Presentations on a selected topic (students will make a presentation on the week's activities or another topic proposed by the professor)

Part 3: Multimedia Security

Session 3.1

Lecture: Multimedia Compression and Formats

- Lossless compression
- Lossy audio compression
- Lossy video compression
- Multimedia containers

Session 3.2

Lecture: Security in Multimedia

- Security in multimedia communications
- Legal issues and licenses
- Digital rights management
- Watermarking and fingerprinting

Session 3.3

Practice: Image Watermarking

Session 3.4

Presentations on a selected topic (students will make a presentation on the week's activities or another topic proposed by the professor)

Staff

Dr. Antoni Martinez-Balleste

Engineer in Computer Science and Technology (Universitat Rovira i Virgili, 2002) and PhD in Telematics Engineering (Universitat Politècnica de Catalunya, thesis Real-Time Pay-per-view of Multimedia Content Protected, 2004).

Specialist in the European Higher Education Space (Universitat Rovira i Virgili, 2006). Tenured associate professor at the Department of Computer Engineering and Mathematics in Universitat Rovira i Virgili (since 2003). Head of studies at URV's Technical School of Engineering (since 2005). Consultant teacher at the Universitat Oberta de Catalunya (since 2003). Member of the IEEE. Member of the Smart Health research group (Universitat Rovira i Virgili, since 2014) doing research on the application of Information Technology and Communications (ICT) in health and health services (e-health, m-health, s-health). Researcher at the Crises group (Universitat Rovira i Virgili, since 2001), doing research on security and privacy in ICT. Visiting researcher at LAAS-CNRS (Toulouse, France, summer 2004). He advised a doctoral thesis on privacy in video surveillance (2014) and is currently advising a thesis on the automatic assessment of pain in new-borns. Author of 74 scientific contributions, including ISI JCR journals, conference contributions and book chapters. Editor of several books on his research areas. Has taken part in 29 research and technology transfer projects, at national and international levels, some of them as principal investigator. Also interested in teaching and quality in higher education, he has taken part in the elaboration of bachelor and master programmes. He teaches undergraduate and master courses on networking technologies and the Internet, multimedia, computer security and research.