Universidad
Politécnica
de Cartagena

Applications on the Internet

Presentation 2020-2021

Teachers

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- Dept. TIC. Office 22. First floor. Antigones.
- **Tutorials**: make an appointment by mail.

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- Dept. TIC. Office 25.
- **Tutorials:** ask teacher.

Some applications…

WIKIPEDIA
The Free Encyclopedia

What do they have in common?

They have been developed on the same "platform": the Web (World Wide Web)

- Designed to work on the Web and take advantage of its features. They take advantage of the Web's ability to provide:
  - Connectivity
  - Scale.
  - User participation.
  - "Collective intelligence".
  - Composition of services.

How do they work?

They use the three basic pillars of the Web: URL, HTTP, HTML.

But also, in many cases:

- They generate content dynamically.
- They use the information provided by the user.
- They provide a rich user interface, responsive to user actions.
- They use sophisticated algorithms to extract information from the data they handle.

What technologies do they use?

In addition to the three basic pillars of the Web, applications / services have been taking advantage of / adding / superimposing additional technologies:

- Information processing languages on the server: PHP, ASP, JSP ...
- Data sources: BBDD, spatial data, positioning ...
- Processing languages on the client: javascript, Java
- New formats: pdf, animations, audio, video ..
- Algorithms: machine learning (artificial intelligence, pattern detection)

But then, applications in *Internet*?

The Internet is not equivalent to the Web.

There are many applications / services that use the Internet without using the Web ...

- Instant messaging
- P2P
- Online games
- Others…

In many cases, they take advantage of some of the technologies that have been developed for the Web.

Or they simply provide an interface to the web application optimized for the device

- Many mobile applications (apps).

In this course we introduce concepts and tools that you can use to develop applications that take advantage of the Internet infrastructure and in particular, the Web

- Guide: https://teleco.upct.es/guia-docente/505104003

Tools for the subject

A computer with a browser

- Activities: do them in class or at home (before and after)

Practically everything that is explained in the course can be tried with the browser

- Firefox, Chrome, IE ...
- They have development tools.
- Wireshark, to examine packages at a lower level.

The server part can be done:

- Installing Apache + PHP +MySQL on a Linux distribution
- Using a Windows equivalent: WAMP, XAMPP, EasyPHP, ...
- Using the IT6 lab server

Practices

- Attendance **very advisable** to pass the course.
- IT6 laboratory in the basement of Antigones.
- In pairs or individually.
- Start: September 21, 2021.
- A questionnaire will be filled out individually through the Aula Virtual related to the development of the lab, for some sessions.
- Delivery of a final project at the end of the course: web application related to the contents

Evaluation

Exam

- **2 partials (30% each) and final**
- **Partial 1: blocks I and II**
- **Partial 2: block III**
- **Theory**. The use of additional materials is not allowed. 50% of exam.
- Questions: to develop, related to **theory and labs**. The use of additional materials is allowed with conditions (later). 50% of exam.
- **Minimum grade 4 of to average with other tests.**

Labs: questionnaires (10%).

Final project: web application (30%).

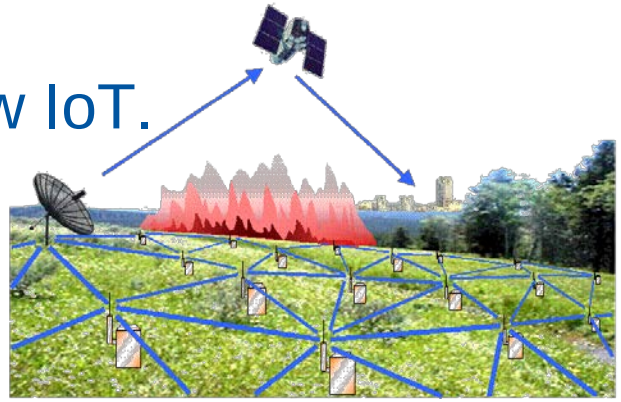
Consult teaching guide

Something about me…

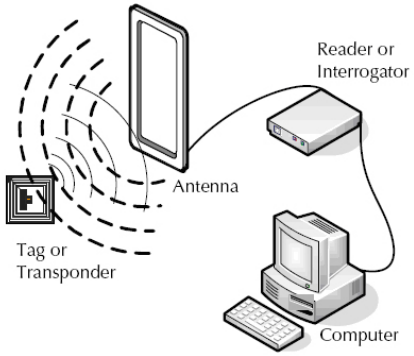
Professor and researcher since 2002.

Research on:

- Sensor Networks (WSN), is now IoT. Mainly media access control (MAC)energy efficient



- Radio Frequency Identification (RFID). Efficient MAC protocols and analysis.



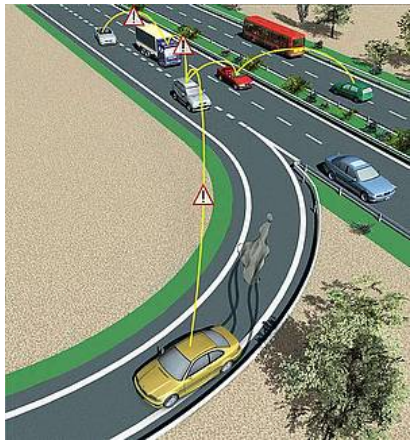
My current research ...

Vehicle networks:

- https://www.youtube.com/watch?v=G5kJ_8JAp-w

Current Research in Vehicle Networks:

- Accident estimation models.
- Calculation of accident avoidance trajectories.
- Congestion control through power and transmission rate.
- Simulation.
- Use of AI/ML



End of Degree Projects

Open to suggestions:

- Related to Web applications.
- Data analysis with Machine Learning.
- Simulation with OMNET ++
- Virtual environments with Game Engines (Unity3D, Unreal 4)
- GPU programming

Related to my lines of research

- http://pcacribia.upct.es/veneris/