Hypermedia Applications (Web e Multimedia) 2017-2018

Course Introduction

Teachers:
Franca Garzotto
Vittorio Zaccaria
Mirko Gelsomini

Outline

- Educational Goals
- Contents
- Course Format
- Exam
- Organization, Schedule & Timing
- Bibliography

EDUCATIONAL GOALS (what you will learn)

- KNOWLEDGE
  - **DESIGN**
    - Methods and techniques for DESIGNING online *hypermedia* for *stationary* (and *mobile)* devices
    - Hypermedia =
      - Non linear multimedia content (topologically structured as a graph)
      - Interaction: navigation (link traversing)
    - Focus: **content intensive hypermedia**
  - **USABILITY**
  - **TECHNOLOGY**
    - Architectures, languages, and tools to
      - prototype
      - develop

    the above class of applications

EDUCATIONAL GOALS (what you will learn)

- SKILLS
  - CONCEPTUAL DESIGN
    - Capability of translating requirements (problem space) into conceptual design (solution space) of a web application, **specifying content, structures, navigation, and presentation characteristics** of the application at the proper level of abstraction
  - USABILITY EVALUATION
  - PROTOTYPING
    - Capability of creating a **demonstrative version** of the application that "give the feeling" of design choices
  - SOFTWARE DESIGN AND IMPLEMENTATION
    - Capability of
      - defining the sw components of a web application and implementing them
      - Discriminating between different technologies and how they fit together

Contents

1. Methodology: Conceptual Design & Usability Evaluation

2. Front-end Technology

3. Back-end Technology

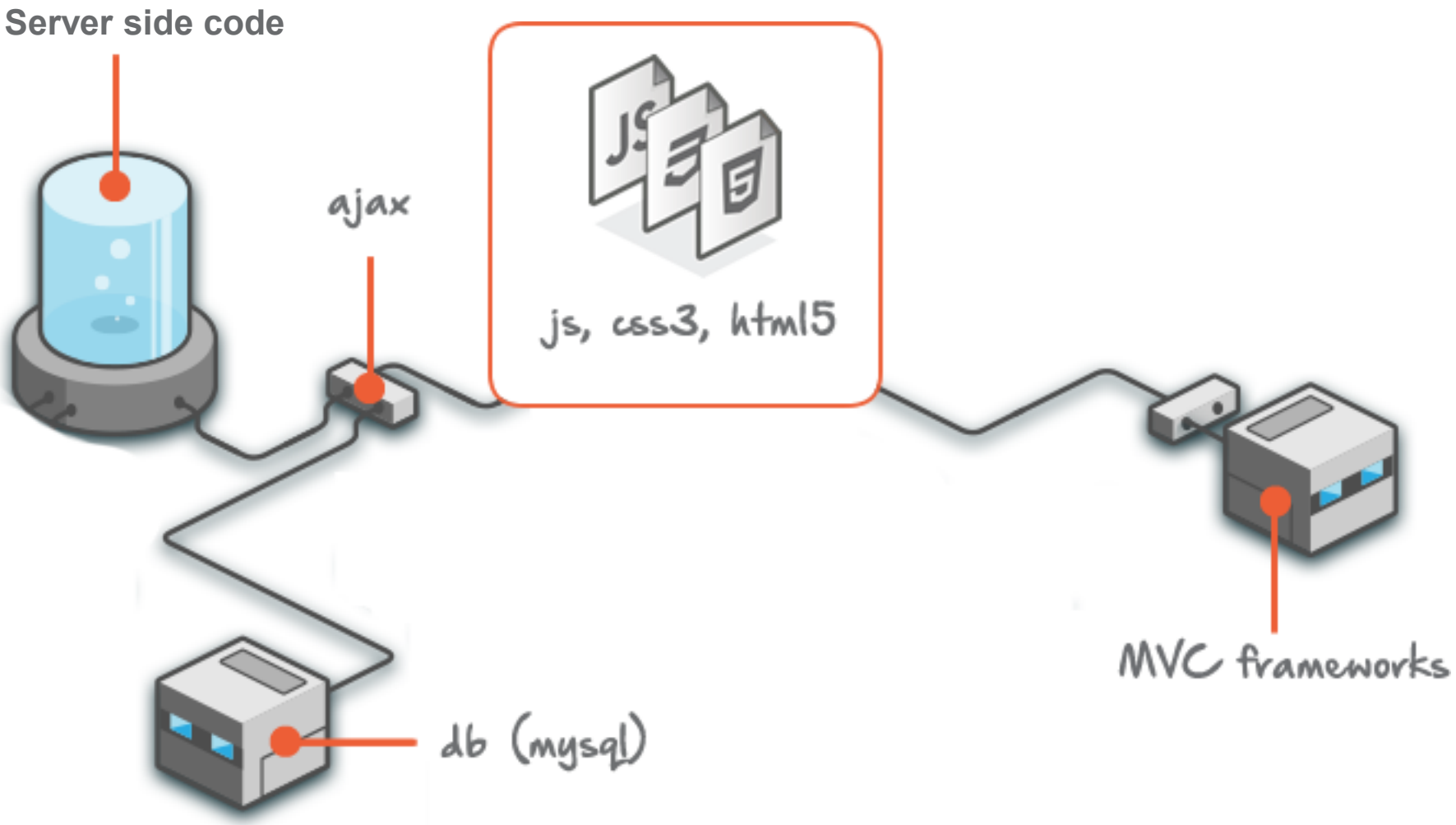
Part 1: METHODOLOGY

Methodology

- **Introduction to web design**
  - Multiple application design dimensions (information, navigation, presentation)
  - Information architecture
- **Design Models**
  - HDM/IDM model
- **Web Usability**
  - Usability Principles and Heuristics for web application interfaces
  - Usability Evaluation Methods

Part 2: FRONT-END TECHNOLOGY

FRONT-END TECHNOLOGY



FRONT-END TECHNOLOGY
Fundamentals of website development

FRONT-END TECHNOLOGY
Fundamentals of website development

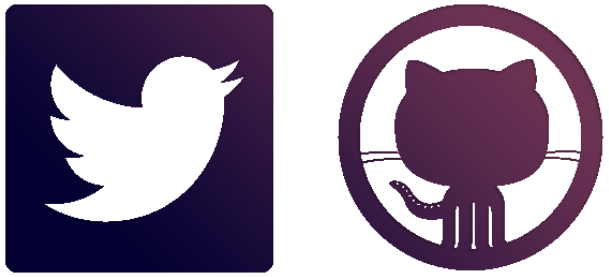
- HTML 5 (HTML recap, new features, comparisons among versions)
  - Basics (tags and terminology)
  - Editors and Viewers
  - Structure and Divs
  - Images and links
  - Menu and lists
  - Colors, Font and Styling
  - Com
  - …
- CSS 3
  - Graphics vd Contents
  - Syntax (Selectors and Cascading Concept)
  - Id, Classes, parenthood
  - Pseudo-classes and multiselectors
  - Positioning (margin, borders and padding)
  - Floating, absolute, relative and fixed

FRONT-END TECHNOLOGY
Scripting languages and animations

FRONT-END TECHNOLOGY
Scripting languages and animations

- Javascript
  - Basics (tags and terminology)
  - Editor and Viewer
  - Data Types
  - Debugging
  - Variables and Objects
  - Conditionals and Loops
  - Arrays and Strings
  - Functions (return and callbacks)
  - Ajax Calls

FRONT-END TECHNOLOGY
Common frameworks



Twitter Bootstrap

FRONT-END TECHNOLOGY
Common frameworks

- Jquery (Javascript Framework)
  - The Dom
  - Selectors
  - Events and Functions
  - Modifying HTML contents and CSS styles, live
  - Manipulation
  - Animations and Effects
  - Ajax Calls
- Jquery UI
  - Premade elements
  - Animations
  - Styling
- Frameworks
  - MVC Architecture - An example: Angular JS
- Bootstraps
  - An Example: Twitter Bootstrap

FRONT-END TECHNOLOGY
A look at responsivity and mobile development

FRONT-END TECHNOLOGY
A look at responsivity and mobile development

- Responsivity
  - Layout
  - Containers
  - Multiple-sized websites
  - Css Media Queries
  - Viewport scale

BACK-END TECHNOLOGY

Useful Prerequisites

- Being acquainted with an imperative programming language
- Being operational with CLI environments and LINUX/UNIX
- Being acquainted with some database design concepts (Relational model, SQL)

What skills you will learn in this part

- Take your Javascript programming to the next level by building a web application using Nodejs
- Experience with industry standard Web Services platform (Heroku)
- Development using git

What I expect from you at the end of this part

- Deploy the application designed in the first part into heroku so that
  - It is usable (according to provided requirements)
  - It complies with REST guidelines
  - It uses dynamic data fetched from a database

Example

- https://polimi-hyp-2017-team-10461666.herokuapp.com/

Course Format

- Ex-cathedra lectures
- Exercises and hands-on

  exemplifying step-by-step the use of
  - design model
  - technology

  (bring your laptop to the classroom!)
- Project Based Learning
  - Project tutoring
  - Project-based Exam

EXAM: project based

3 parts, 1 project:

1. Design and Usability Study(Prof. Garzotto)
2. Front-End Implementation (Prof. Gelsomini)
3. Back-End Implementation (Prof. Zaccaria)

Project specifications assigned by teachers

Example from last year: Web site for a health institution (e.g., hospital, care center, diagnostic center)

In addition, to verify technological competence and balanced participation to technology project work («did YOU really contributed to implementing this project?»): *oral or written questions on technology* during *technology project discussion*

Suggestion: **TEAM** work among 2-3 people (max 3)

EXAM: project activities

1. Conceptual Design of a web application according to the assigned specifications
2. Design Reporting (Documentation)
3. Prototyping (using front-end technologies)
4. Prototype technical documentation
5. Usability evaluation of the prototype
6. Usability Evaluation reporting

7. Back-end implementation
8. Back-end implementation documentation

EXAM: project output

Output to deliver: **2 parts**

PART 1

1. **Prototype 1**: interactive prototype for a subset of the designed application, using some of the FRONT-END technologies presented in the course
2. **Technical Documentation of Prototype 1**
3. **Design documentation** (diagrams, tables, and wireframes)
4. **Usability Report**

PART 2

5. **Prototype 2:** interactive prototype for a subset of the designed application including BACK-END implementation, using some of the technologies presented in the course
6. **Technical Documentation of Prototype 2**

Exam Rules

In order to pass the exam, both parts must be evaluated as sufficient

Evaluation is based on

- **Teachers' analysis of both parts**
- **Teachers' testing of the code**
- ***Oral or written aswers to technology questions during the discussion of implementation project*** *(scored passed/not passed: no extra points if passed):*

  few questions on technology, to verify that each member of a project team has contributed to the implementation effort

Weighted scores:

Prototype 1: 30% of final score

Design and Usability: 30% of final score

Prototype 2: 40% of final score

Exam Rules (continuation)

- The project topic and specs assigned during the course
  - remain the same till July.
  - **will be changed in September and February**

- Part 1 can be delivered DURING the course
- The score achieved on Part 1 DURING the course will hold till the end of July. After that date it is mandatory to re-do the entire project

- If a member of the project group does **not** pass the written/oral exams on technology it is a assumed that he/she has not contributed actively to the implementation work of the team: **he/she will have to leave the group and submit a different project**

COMMUNICATION CHANNELS

No email please, unless dramatically needed

Use online board: http://beep.metid.polimi.it

- **Course: [2017-2018] Hypermedia Applications (Web&Multimedia)**
- **login using your polimi credentials**

- **Course materials**
  - **Slides, papers, technical reports, links to online resources…**
- **Q&A to/from teachers (forum)**
- **Announcements, news, …**
- **Exam results**
- **Communication among students**
- **….**

All students enrolled in this course should be automatically registered in beep when the course is confirmed in their study plan; please check!

Schedule

089318 - HYPERMEDIA APPLICATIONS (WEB AND MULTIMEDIA)

Prof. Franca Garzotto, Mirko Gelsomini, Vittorio Zaccaria

Wed: 10:15-12:15

Thu: 8:15-10:15

Start of lessons: 28/02/2018

End of lessons: 07/06/2018

ID	DAY		ROOM	TOPIC
1	Wed	Feb 28	DD	Course overview + PROJECT PRESENTATION
2	Thu	March 1	F01	Design: General concepts; design in the large and in the small; Design in the large: IDM-1 [Garzotto]
3	Wed	March 6	ROG	Design: IDM-2 [Garzotto]
4	Thu	March 7	F01	Design: Design in the small and DB mapping (L-IDM) – FRONT-END PROJECT SPECIFICATION [Garzotto]
5	Wed	March 14	DD	Design: Design exercise
6	Thu	March 15	F01	Design: Web Usability [Garzotto]
7	Wed	March 21	DD	Technology/Frontend – Slides + Demo - Web page construction basics: HTML [Gelsomini]
7	Thu	March 22	F01	Technology/Frontend - Slides + Demo - Web page construction basics: CSS [Gelsomini]
8	Wed	March 28	ROG	Technology/Frontend - Slides + Demo - Web page construction frameworks: Bootstrap [Gelsomini]
9	Thu	March 29	F01	HOLIDAY
10	Wed	April 4	ROG	Technology/Frontend - Slides + Demo - Web page construction frameworks: Bootstrap [Gelsomini]
11	Thu	April 5	F01	Technology/Frontend - Slides + Demo - Search Engine Optimization [Gelsomini]
12	Wed	April 11	GAT	Technology/Frontend - Slides + Demo - Client-side JavaScript: MVC, jQuery [Gelsomini]
13	Thu	April 12	F01	Technology/Frontend - Slides + Demo - Client-side JavaScript: AJAX [Gelsomini]
14	Wed	April 18	ROG	SUSPENDED – LAUREE
15	Thu	April 19	F01	SUSPENDED – LAUREE
16	Wed	April 25	/	HOLIDAY
17	Thu	April 26	F01	SUSPENDED
18	Wed	May 2	/	SUSPENDED
19	Thu	May 3	F01	Design: Tutoring [Garzotto + Gelsomini]
20	Wed	May 9	DD	Technology/Backend - Slides - Introduction to backend web technology; server-side JavaScript (NodeJS) [Zaccaria] – FRONT-END PROJECT DELIVERY
21	Thu	May 10	F01	Technology/Backend - Demo - Server-side JavaScript (building REST interfaces and serving content) [Zaccaria]
22	Wed	May 16	ROG	Technology/Backend - Demo - Advanced JavaScript (async programming and database access) [Zaccaria]
23	Thu	May 17	F01	Technology/Backend - Demo - Advanced JavaScript (modularization and testing) [Zaccaria]
24	Wed	May 23	DD	Technology/Project Tutoring [Zaccaria]
25	Thu	May 24	F01	Technology/Project Tutoring [Gelsomini-Zaccaria]
26	Wed	May 30	DD	Technology/Project Tutoring [Zaccaria]
27	Thu	May 31	F01	Technology/Project Tutoring [Zaccaria]
28	Wed	June 6	DD	Technology/Project Tutoring [Zaccaria]
29	Thu	June 7	F01	Technology/Project Tutoring [Gelsomini-Zaccaria]
		Tbd		Official appello- BACK-END PROJECT DELIVERY OR FULL PROJECT DELIVERY
		Tbd		Official appello - FULL PROJECT DELIVERY

Check updates on beep

Schedule

MARCH-APRIL: DESIGN, USABILITY, FRONT-END TECHNOLOGY (lessons and tutoring)

Beginning of May: PART 1 project delivery

MAY-JUNE: BACK-END TECHNOLOGY

AT OFFICIAL EXAM DATES:

- If Part 1 passed during the course: PART 2 project delivery + ORAL/WRITTEN in **first** and **second** exam date
- If Part 1 NOT passed during the course: in All exam dates **PART 1 + PART 2** must be delivered TOGETHER; ORAL/WRITTEN exam at the exam dates

Teaching material

- Scientific Papers
- Slides (in English)
- Online documentation (links on the course slides)
- Books
  - About Design
    - D.Bolchini, L.Mainetti, P.Paolini "Progettare siti web e applicazioni mobili", McGraw Hill, 2006 (in Italian – good intro do IDM but technology sections would need an update)
  - About CSS
    - E.A.Meyer "Cascading Stylesheets - The Definitive guide", 2 edizione, editore ORelly, 2004 (a classic book, but recent developments missing)

Free online courses

(for those of you who wants to start learning how to code with css, html, js…)

https://www.codeschool.com/learn/html-css
https://www.codecademy.com/learn/web

https://www.codeschool.com/learn/javascript
https://www.codecademy.com/learn/javascript

https://www.codecademy.com/learn/jquery

Official Reference:

HTML: http://www.w3schools.com/html/
CSS: http://www.w3schools.com/css/
JS: http://www.w3schools.com/js/
JQUERY: https://jquery.com/ , http://api.jquery.com/ , http://learn.jquery.com/

Questions?