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Web Programming (CSci 130)

California State University Fresno
College of Science and Mathematics
Department of Computer Science
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Outline

- Introduction
- Syllabus
- Tests & Assignments
- Conclusion

Presentation

- Instructors:
  - Hubert Cecotti (classes)
  - Rogelio Romero (labs)

- If you don't know me…
  - Research interest (in relation to projects for 198)
    - Machine learning & Pattern recognition (Python, Matlab)
      - Application to images (document analysis and recognition)
      - Application to physiological signals (EEG signal) for the study of brain-machine interface
    - Human-Computer Interaction (2 Tobii 4c eyetrackers - C#)
      - Virtual keyboards and applications in assistive technologies
    - Virtual Reality (HTC Vive, Valve Index, Oculus Quest 2, in lab – Unity/C#)
      - Application to education, human-computer interaction, visualization of signals
  - Possible projects
    - In collaboration with the Department of Enology
      - Image processing of grape images
      - Signal analysis of physiological signals – Test of odorants
    - Possibilities with the Department of Art & Design
      - VR applications
  - Paid research positions
    - Brain-computer interface
    - VR / Image processing for Art History
    - Agri-technology (image/signal processing with ag data)

Prerequisite courses

- Csci 115, Csci 41, Csci 40
  - You know data structures
  - You know principles related to lists, arrays
  - You know key principles of Object-Oriented Programming (OOP)

  …. + some databases, some functional programming, …

- In Csci 130, you will **use** data structures, but you will use existing functions for manipulating arrays, strings, … you will not have to implement such data structures from scratch
- The difficulty, the challenge
  - To properly organize your code, to develop clean and well documented code
  - To create functions

Web programming (1)

- What it is **not**:
  - It is not Web design (in your free time, feel free to learn how to use GIMP)
    - Photoshop, GIMP,…
    - Images, typography,...
  - However,
    - It is not forbidden to use appropriate guidelines from web design and to make some efforts to enhance the user experience for what you will do.
  - Important to keep a **holistic** view about:
    - Who is going to use/read the web documents that you will create during this course
- Web Programming → Web documents / Web forms
  - From document engineering to data engineering
  - Web pages = Document
    - Structure + Content + Events (to get the content and structure dynamic)

Web programming (2)

- Introduction to documents and web documents
  - Documents = a generic word to represent many items
    - For the web
    - Static/Dynamic
    - Logical part + the presentation
  - Markup languages (**HTML5** , **CSS3**)
- Client side
  - Programming language: **JavaScript**
    - Used in many places – You must know JavaScript and its strengths and weaknesses
- Sever side
  - Programming language: **PHP7**
    - Still widely used
  - ~~Database~~ Database Management System: MySQL
    - SQL queries can be used on

Web programming (3)

- Users are part of the system
  - → Human-Computer Interaction
- Management of different entities
  - → Software engineering
  - → Separation of concern

- Separations
  - Presentation / Structure
  - Client / Server

Syllabus (1)

- Schedule
  - Classes
    - Monday-Wednesday: 1h00-1h50 PM (Industrial Tech Bldg Rm 101)
  - Labs
    - Tuesday-Thursday: 3h30-5h20 (IT294)
      - It depends on the section
- Attendance
  - Questions (short quizzes) on Canvas during class time
    - For the attendance
    - To assess some learning outcomes from the class
    - To get some feedback

Syllabus (2)

- Contact:
  - Hubert Cecotti
    - hcecotti@csufresno.edu
  - **Office hours**:
    - It is part of what you pay at Fresno State
      - 1 on 1 discussions about the course, help about things related to the class
      - The instructor can help but he is not a debugger
    - Tue-Wed: 9-10h50am
    - → Don't hesitate to come for explanations related to the class
    - → Don't use office hours for just administrative issues
  - Email:
    - In the object, you must put the string "[CSCI130]".
    - Be formal in the content of the email, it is **not** for instant messages.
      - For a discussion, for questions that require long exchanges, it is better to come directly to the office.
- Do not wait that it is too late to contact me!
  - Feedback and comments are always very welcome
  - Be careful to deadlines

Syllabus (3)

- Canvas
  - All the material from the different classes will be available on Canvas
  - Class + Labs
  - If you print the pdf presentation to the classes
    - **DO** take notes. The slides are **NOT** enough for succeeding
    - Visit free websites:
      - https://www.w3schools.com/
    - Try and test all the different elements
      - In small example
      - In a personal project that you can include as part of your portfolio for finding a position

Syllabus (4)

- Software/technologies that will be used:
  - Client side
    - Wed documents
      - The logical/structure part (HTML5)
      - The presentation (CSS3)
    - Programming
      - JavaScript (it is not Java !!!)
  - Server side
    - Server (e.g. Apache)
    - Databases
      - MySQL
    - Programming
      - PHP7
  - At the end, we will discuss some frameworks to simply your life
    - In this course, you will be able to do everything on your own, without relying on some libraries or frameworks

Syllabus (5)

- Midterms: 15% each
  - If you totally fail a midterm – you can still pass the course
  - Past years: some students give up at the first midterm
    - If you do not study, it will be hard to get an A - there is no magic
- Midterms and Deadlines
  - The time and dates for the Midterms and the Project may change
  - The information will be given in class and on Canvas
- **If** you print the slides
  - Print **after** the class! (possible updates and changes after the presentation)
  - Print only the relevant slides, several slides per page, or let some space to take notes
  - It is better to maintain some examples in a running file
    - (HTML, Javascript, PHP, …) and go through examples than to go through the slides

Materials (1)

- Links to video, documents, will be given on Canvas
- There are many books in open access, available at the library
  - You can check it online ““name of what you want” book pdf” on google.
  - Pdf files: books are large files, no need to print! Just use it as a reference.
- To be able to try everything on your computer!
  - In this course, practice is very important.
  - Do not overestimate your ability to code in a limited amount of time
  - If you start too late, it is very likely that you will fail the projects

Materials (2)

- Lots of documents, tutorials, video online
  - BUT: not very well organized: easy to get lost, discouraged
  - Lots of all documents and elements from before HTML5 !
    - Be careful about tutorials/documents related to old versions
- Some recommended links and books (easy to find)
  - HTML5 & CSS3 (7th edition) by E. Castro and B. Hysop, 2012, 606 pages.
  - CSS3 pushing the limits by S. Greig, 2013, 386 pages.
  - Web development: https://developer.mozilla.org/en-US/
  - HTML, CSS, Javascript, PHP: https://www.w3schools.com/
  - Web Hypertext Application Technology Working Group: https://whatwg.org/
  - PHP manual: http://php.net/manual/en/index.php
  - Apache documentation: https://httpd.apache.org/docs/2.4/

Learning outcomes (1)

- A solid understanding of fundamental web document creation
  - by identifying the logical structure of a document and its presentation by using appropriate technologies (**HTML5** and **CSS3**).
- A solid skill of problem solving in web programming
  - by choosing the appropriate tools and identifying data structures and methods to create dynamic websites.
- Programming in **JavaScript** and **PHP** to create dynamic websites.
- Key understanding about the relationships between the client and the server sides.
- Team spirit to solve larger scale problem and use current social media tools to communicate efficiently and share files.
- Presentation of your software effectively
  - write well-structured and well-presented reports and presentations
  - to communicate how their applications can be used with both computer science professionals and general audience.

Learning outcomes (2)

- Focus on
  - The **structure** of the documents
  - The **architecture** of the system
    - "Not the programming language"
  - The flow of the information:
    - Client ← → Server
  - Where data is used, processed, stored
    - Client/Server
- Reflect on the separation between
  - Form (presentation) and substance (meaning)
- To be able to learn a new framework autonomously within a weekend
  - → to be **autonomous** and not dependent to a language or framework

Tests & assignments

- Marking
  - Projects:
    - Group project: Game 15%
    - Individual project: Data browser 15%
  - Midterm 1: (on Canvas): 15% (week 1 to Midterm 1)
  - Midterm 2: (on Canvas): 15% (Midterm 1 to Midterm 2)
  - Selected graded labs: 10% (first part of the semester: HTML/CSS/JS)
  - Attendance & participation: 5% (the questions you get at each class)
  - Final: 25% (On Canvas)
- Remark
  - Attendance will be monitored but it doesn't count for any grade
  - Be ready for the 1st Midterm
    - If you totally fail the first midterm, it will be obviously hard to get an A !!! ☹
    - Issues: time management for coding, lack of knowledge of the definitions, lack of rigor == to be too approximate when doing things

Past Projects

- "Online game" – turn-based / puzzle
  - Example: checkers

- 2 main parts
  - Client side (the game)
  - Server side (managing user profiles, saving scores, ranking, saving games,…)
- **Past projects**
  - Gomoku (5 in a row)
  - Picross
  - Batttleship

Provisional schedule

- See it on Canvas …
  - Everything is on Canvas
- Questions about the files on Canvas?

Lab …

- Quick look at what is available on Canvas
  - Main structure of the classes and labs
  - There is a TA for some of the labs
    - It is not a TA for 1 group, it is a TA for some of the lab sessions.
- Questions?

- Lab:
  - Structure vs. Layout
  - From MS Word to HTML5 & CSS3

Warning

- Midterms & Final
  - **Lack of study**
    - No knowledge of basic HTML and CSS tags and syntax structure
    - You need to be able to develop the code from scratch
  - **Typical issues**:
    - Confusions between PHP and JavaScript for the syntax, the name of the instructions,…
  - **Too much copy pasting**
    - It works but you cannot type it on your own or remember anything
  - **Too much quora and stackoverflow**
    - It works, you don't know why, and you haven't understood anything
  - **Lack of rigor**
    - Everything is the same, who care…
    - Everything in the same file
    - Variable names: a,b,c, … comments and variables with Spanish, Hindi, Chinese names…

Concluding remarks

- Some of you know already a lot
  - Webpages for a particular hobby, personal projects…
- Don’t go rogue if you know already some of the content
  - You are assessed based on what is given in the course
  - Assessments are consistent across all students
  - Everybody is treated the same, with respect and integrity
- Source of errors, bad grade
  - Lack of work and practice
    - Being professional, to know the definitions, the meaning of the main instructions
  - Mixing languages: syntax of JS, PHP
  - Mixing jQuery, DOM manipulation