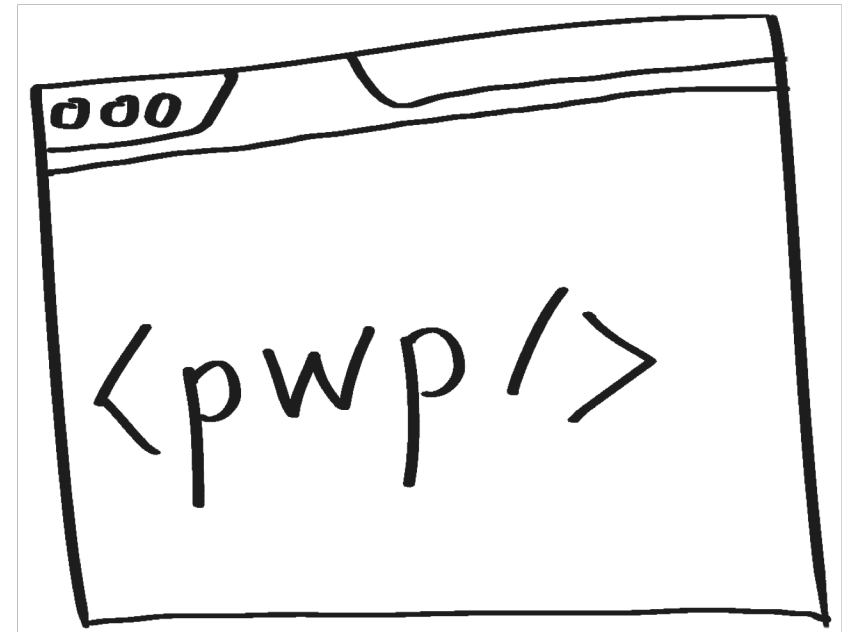# Practical Course:
Web Programming

Human-Centered Ubiquitous Media
Prof. Dr. Albrecht Schmidt, Fiona Draxler,
Thomas Kosch

Winter Term 18/19

Agenda

- Organization of this course

- Principles and introduction of the web

- Presentation Exercise 1

Organization

- **Dozent:** Prof. Dr. Albrecht Schmidt
- **Kontakt:** ✉ 📭 pwp@um.ifi.lmu.de
- **Semesterwochenstunden:** 4
- **ECTS-Credits:** 6
- **Modul:** Master P5.0.2 oder P5.0.4: Gruppenpraktikum zu fortgeschrittenen Themen der Informatik I oder Informatik II
  Nach Rücksprache mit dem Prüfungsausschuss auch Anerkennung für P2, P3 oder P6 (Vertiefende Themen für Master) möglich
  Bachelor P17, P18: Vertiefende Themen der Medieninformatik I oder II

Supervisor: Fiona Draxler, Thomas Kosch

If you have any questions, write a mail, pass by the office, or ask in the Slack channel: https://mimuc.slack.com/messages/pwp-ws1819/

Grading

- Individual level
  - We will conduct two interviews (ca. 10 minutes) with each of you
  - You will be invited to present your results on a regular basis
  - Assessment of your exercises, coding style, and oral participation

- Group level
  - Result of the group project
  - Coding style of the group project

Semester Plan

Datum	Thema
22.10.18	Foundations WWW (Organization, Grading, Webserver, HTTP, HTML)
29.10.18	Webserver implementation presentation, Web analytics, cookies, security and privacy
05.11.18	NodeJS (or similar), asynchronous communication
12.11.18	Express (or Restify), implementing and using microservices (e.g., clmtrackr)
19.11.18	Typescript, Coding conventions (styleguide), JSLint
26.11.18	Angular (or similar), Task implementation (e.g. memory game, hardware integration using NodeMCUs)
03.12.18	JSON, Messaging + Support

10.12.18	Presentation of projects (Fake News Detector, Web page and visualization) , finding teams, Interviews I
17.12.18	Mock-ups bauen
07.01.19	UI Implementation, Database
14.01.19	Implementation Logic I, PM2
21.01.19	Implementation Logic II, Testing
28.01.19	Implementation Logic III, final presentation, (eventually Interviews II)
04.02.19	Interviews II Backup

A (coarse) Architecture of the World Wide Web

WWW

| HTML (Design) | HTTP (Communication) | URL (Location) |
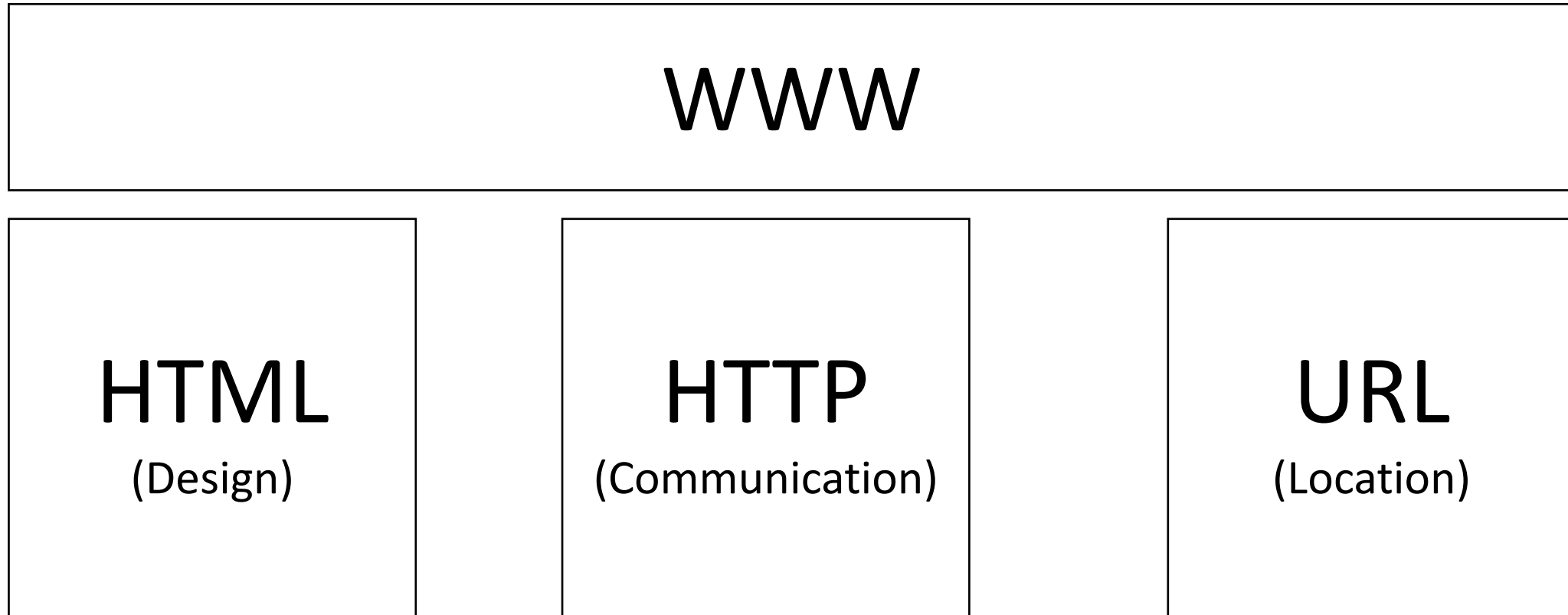
Hypertext Markup Language (HTML)

HTML: This is what your browser sees!

This is what you see!

```
<html>
    <body>

        <h1>Hello Web Programing Course :)</h1>

        <h2>This is a simple HTML example!</h2>

        <p>In this course, you will learn the principles behind
        the web and develop your own web application!</p>

    </body>
</html>
```

Hello Web Programing Course :)

This is a simple HTML example!

In this course, you will learn the principles behind the web and develop your own web application!

Example: curl -i -H "Accept: application/xml" http://ubicomp.net

Visit a webpage, right click and press "View page source"

Other Web Technologies

PHP

```
<!DOCTYPE html>
<html>
<body>

<h1>My first PHP page</h1>

<?php
echo "Hello World!";
?>

</body>
</html>
```

Javascript

```
<script>
  alert( 'Hello, world!' );
</script>
```

CSS

```
.center {
    text-align: center;
    color: red;
}
```

Hypertext Transfer Protocol (HTTP)

Example GET Request: curl -I http://ubicomp.net

Response:

HTTP/1.1 200 OK
Date: Sun, 15 Apr 2018 12:44:56 GMT
Server: Apache
Last-Modified: Wed, 01 Nov 2017 16:33:19 GMT
ETag: "702-55cee6de9e9fe"
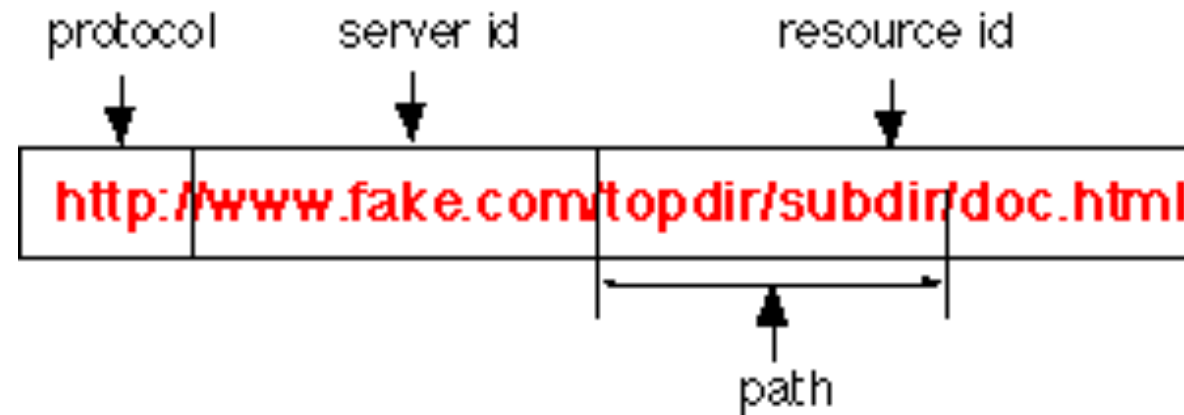Accept-Ranges: bytes
Content-Length: 1794
Vary: Accept-Encoding
Content-Type: text/html

Uniform Resource Locator (URL)

- A simple web address

What is a Webserver?
What Webserver do you already know?

Webserver Technologies

Apache:

- Handles static content

- Separate threading

- Old and complex

Nginx:

- Handles static content

- No separate threading

- Handles requests fast

- Lightweight and resource-friendly

NodeJS:

- Handles dynamic content

- Asynchronous requests

- Handles requests fast

- Lightweight and resource-friendly

How do you usually search the internet?
How does your browser find the desired content?

Hosting your own Webserver at your Home

- For example with a NodeMCU (ESP8266)