Interaction Prototyping 2.0

Winter Semester 2015

TU Delft Delft University of Technology

Prof. Dr.ir. Riender Happee

Prof. Dr. Klaus Bengler

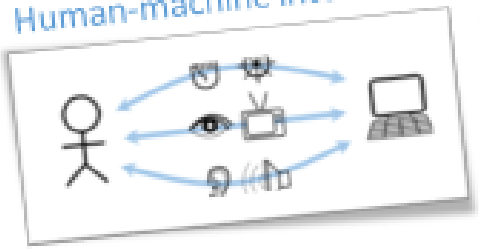
HFE Master Seminar

Human Factors of Automated & Cooperative Driving

Driver state inference

Automated and cooperative driving

Human-machine interaction



User interfaces

9 Seminar sessions consisting of:

- 30 min. international expert lecture
- 30 min. literature presentation (prepared by teams of students)
- 30 min. of active discussion amongst students

Winter term (starting 21.10.2015)
On Wednesdays, 16-18h
Credits: 3 ECTS
Language: English

What I hear, I forget.

What I see, I remember.

What I do, I understand.

—Lao Tse, Chinese philosopher, b. 604 BC

Hanmail Paper Prototype:
http://www.youtube.com/watch?v=GrV2SZuRPv0

06 October 2015

Motivation

- Software products that are **difficult** to understand and **uncomfortable** to use, are **not accepted** by the user.
- In **user centered design** (UCD) approaches within software development processes, **understanding of users, tasks and environments** identifying needs and establishing requirements for a positive user experience (UX) is essential to achieve a high **usability**.
- User centered design implies **knowledge of the future user** and the **intended context of use** to capture software products functionality and develop interactive products that meet users' expectations.
- It consists of the following phases:
  1. **Analysis** of the context of use and **requirements** definition
  2. **Design** of prototypes
  3. **Implementation** of prototype
  4. **Evaluation**

However…

…hi-fi

interaction prototyping

requires basic

interaction programming

skills

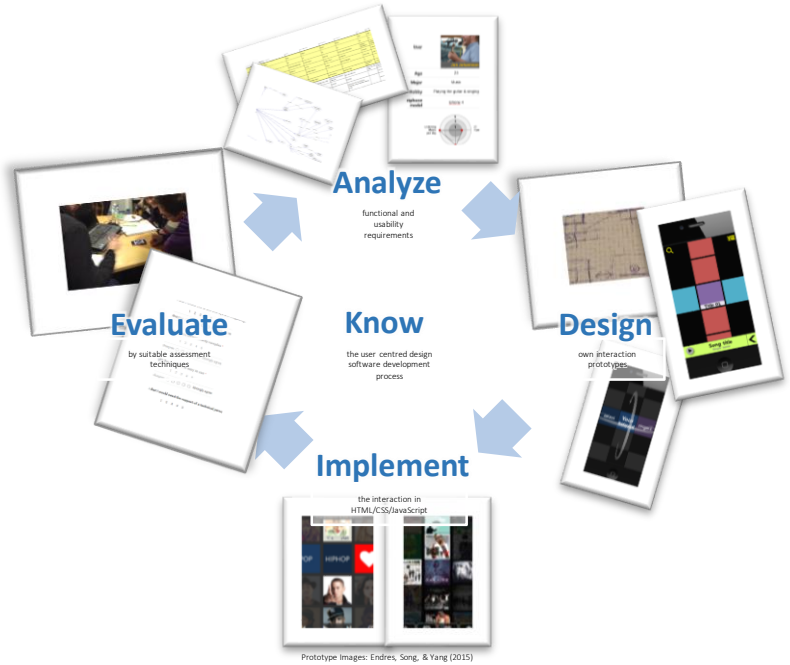
Interaction Prototyping

Part I: Interaction Programming Block Course

During the semester break!

Learn: 5.-9. October (9-17h)
Exam: 20. October (14-16h)

Part II: Interaction Prototyping Practical Course



Prototype in teams:
On Tuesdays (14-16h)

Educational Objectives

Interaction Programming

- **Know** HTML5/CSS3/JavaScript programming concepts.
- **Implement** executable web applications.

Interaction Prototyping

- **Know** the user-centered design software development process and its methods.
- **Design** and create own interaction prototypes.
- **Implement** own concepts as HTML5/CSS3/JavaScript applications.
- **Assess** the created interaction concepts on the basis of appropriate evaluation methods.

Your Lecturers

Interaction Programming

Markus Zimmermann

zimmermann@lfe.mw.tum.de

Interaction Prototyping

Antonia Conti

conti@lfe.mw.tum.de

Your Tutors

Annika Stumpf

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Niklas Lütteken

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David Schopf

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Module

Human Factors Engineering

- Master
- **8 ECTS** (elective module)

Mechanical Engineering

- Bachelor & Master
- **7 ECTS**
  - 3 ECTS (supplement course)
  - 4 ECTS (practical course)
- Less effort needed due to prior programming skills

Effort

Expected course load:

- **40 hrs** in total for block course
- **3 hrs** per week for lecture + tutorial
- **9 hrs** per week **per person** for prototype design/implementation/evaluation
- **40 hrs** in total for wrap-up & presentation/poster preparation

240 hrs (8 ECTS) PER PERSON ≙ IDP, ≙ ¾ semester thesis

- **Beneficial** is a basic knowledge in the area of software development, programming or Web page design.
- **All necessary techniques** are taught during the block course

PART I
INTERACTION PROGRAMMING

Part I: Interaction Programming

- Block Course (one Week). Alternating:
  - **Theoretical** Part (lectures)
  - **Practical** Part (tutorials)
  - **Tutors** are present for clarification and assistance!

Part I: Preliminary Schedule

	Monday	Tuesday	Wednesday	Thursday	Friday
9:15-10:45	**A** Web Apps **B** HTML5 (I)	**D** CSS3	**F** JavaScript (I)	**G** jQuery (I)	**H** APIs
11:00-12:30	Weather app structure	Weather app layout & style	Interaction for the weather app	Revise interaction	Load data from forecast.io, use GPS
12:30-13:30	**Lunchbreak**	**Lunchbreak**	**Lunchbreak**	**Lunchbreak**	**Lunchbreak**
13:30-15:00	**B** HTML5 (II) **C** Forms	**E** CSS Frameworks	**F** JavaScript (II)	**G** jQuery (II)	**I** Animations and Transitions **K** Mobile Apps
15:15-16:45	Weather app structure	Weather app: frameworks	Data objects for the weather app	Widgets & Gestures	Final improvements

Part I: Practical Exam

- Strongly recommended prerequisite for part II
- Covers HTML, CSS, JS: small programming project
- 2 hours, open-book & open-internet
- BYO (bring your own) computers
- Achieving 50% of the given requirements is sufficient
- **First semester week**: 20 October, 14-16h

PART II
INTERACTION PROTOTYPING

Part II: Interaction Prototyping

- Semester Course:
  - **Practical** assignments (teamwork of 3 persons)
  - **Weekly meetings** (Tuesdays, 14-16h)
    - **Theoretical Part** (lecturers) or
    - **Milestone Presentations** (teams)
  - **Tutorials** (1h individual appointments with student tutors).

    Student tutors are present for clarification and assistance!

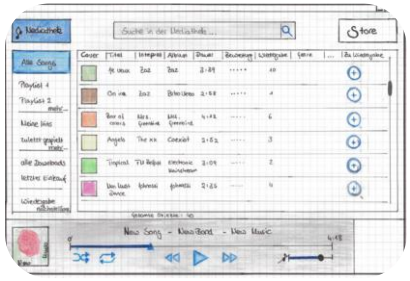
Part II: Overview

- You will practice the user interface development process in **HTML5/CSS3/JavaScript**
  - starting out with **paper prototypes**,
  - followed by the initial **animations** and
  - finally **functional** interaction **prototypes**.
- In groups, you will **create a interaction prototype** according to given requirements specified in the exercise sheets: http://interactionprototyping.github.io/exercises
- The prototypes will be **evaluated** using the appropriate usability testing methods.

Project: Mediacenter

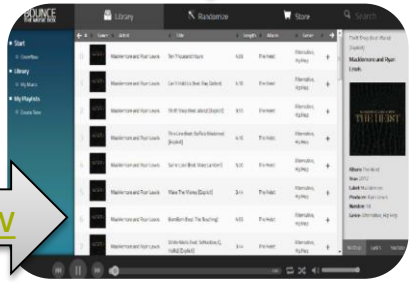
Impressions: SS2013

Bounce Balsamiq Prototyp



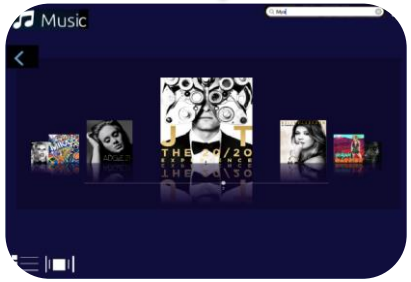
Media Center Papier Prototyp

Pencils Prototyp



Bounce Prototyp

Media Center HTML5 Prototyp



HTML5 Prototyp

Project: Mobile Application

- **Design and prototype a mobile web app**
- One iPhone 4 per participant

Part II: Preliminary Outline

Week	Date	Lecture	Assignments
1	13.10	Q & A	Practice Exam
2	20.10	Interaction programing exam	
3	27.10	1 Introduction 2 User-Centered Design 3 Usability Group assignments	Get Ready (tasks 1 – 4)
4	3.11	Discussion of ideas	Iteration 1 (tasks 5-9)
5	10.11	4 Usability Engineering / Analysis 5 Prototyping / Implementation 6 Design / Forms of interaction	Iteration 1 (tasks 5-9)
6	17.11	Milestone presentation I	Iteration 2 (tasks 10-14)

Part II: Preliminary Outline

Week	Date	Presence	Assignments
7	24.11	7 Mental models 8 Software Evaluation / 9 Evaluation Process	Iteration 2 (tasks 10-14)
8	01.12	Milestone presentation II	Iteration 3 (tasks 15-19)
9	08.12	10 Formative vs. Summative Evaluation 11 Qualitative vs. Quantitative Evaluation 12 Empirical vs. Analytical Evaluation	Iteration 3 (tasks 15-19)
10	15.12	Milestone presentation III	Iteration 4 (tasks 20-23)
11	22.12	Free – no class	Iteration 4 (tasks 20-23)

Part II: Preliminary Outline

Week	Date	Presence	Assignments
	29.12	Free – no class	
	06.01	Free – no class	
12	12.01	Pre-test	Iteration 4 (tasks 20-23)
13	19.01	Guest lecture on industrial prototyping: Phillipp Kerschbaum (BMW)	Iteration 5 (tasks 24-27)
14	26.01	Q & A	Iteration 5 (tasks 24-27)
15	02.02	Poster presentation	

What you are graded on

Methods

- Methodology
- Results
- Creativity
- References
- Tools

Prototype

- Techniques
- Usability
- Functionality
- Level of Detail

PART I & II
ORGANIZATIONAL

HFE grade composition

Interaction Programming (33%)

- **Programming Skills**
  - Implementing specific programming requirements
  - Assessment: Practical Exam

Interaction Prototyping (66%)

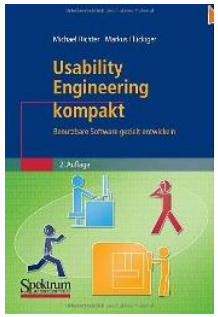
- **Final Prototype**
  - Techniques, Usability, Functionality, Level of Detail
  - Assessment: Code review (50%)
- **Methods (User Centered Design)**
  - Methodology, Results, Creativity, References, Tools
  - Assesment: Final poster presentation (50%)

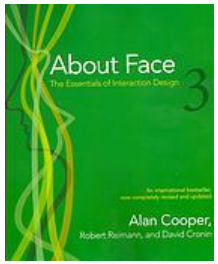
To pass the module, both the interaction programming‘s practical exam (part I) and interaction prototyping‘s project (part II) need to be passed.

Language

- Most of the material used for the course in is English
- Scientific work is international
  - Science language: English
  - Teaching and research stuff: English
  - Terminology: English
- **Consequence**:
  - Teaching in English

Literature: Usability Engineering

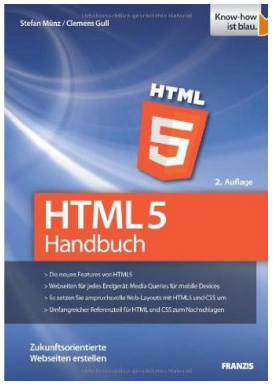




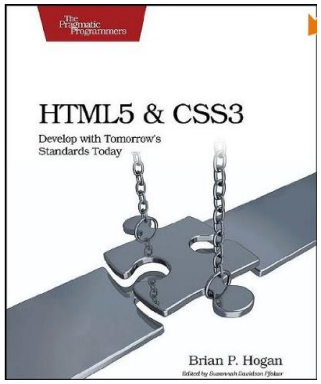
- Richter, M., Flückiger, M. (2010). *Usability Engineering kompakt*. Heidelberg: Spektrum
- Cooper, A., Reimann, R., & Cronin, D. (2007). *About face 3: The essentials of interaction design*. Indianapolis, IN: Wiley Pub.
- http://www.interaction-design.org

Literature: HTML

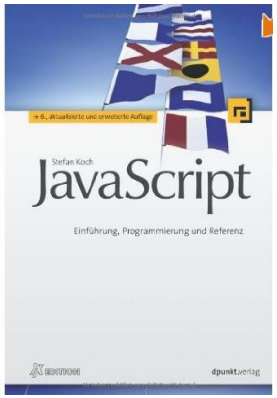
- **Münz, S. (2012).** ***HTML5 Handbuch***



- Hogan, B. P. (2011). *HTML5 and CSS3: Develop with Tomorrow's Standards Today*



- Koch, S. (2011). *JavaScript: Einführung, Programmierung und Referenz*



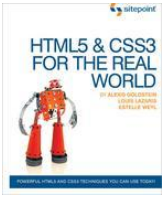
Free HTML5-Literature is available in the Web!!!

Online HTML5 (UB TUM)

- Weyl, E.; Lazaris, L.; Goldstein, A.

  HTML5 & CSS3 For The Real World

  📖 http://proquest.tech.safaribooksonline.de/9780980846904



- Castro, E. (2012). *HTML5 and CSS3*

  📖 http://proquest.tech.safaribooksonline.de/9780131382022

- Hogan, B. P. (2012). *HTML5 and CSS3*

  📖 http://proquest.tech.safaribooksonline.de/9783868992670

And many more: www.ub.tum.de …

📖 Proxy configuration: https://www.ub.tum.de/zugang-zu-ejournals!

OPEN ACCESS

Online course

Interaction Programming

Slides:

http://interactionprototyping.github.io/programming/slides

Exercises:

http://interactionprototyping.github.io/programming/exercises

Interaction Prototyping

Slides on Moodle

Exercises:

http://interactionprototyping.github.io/exercises

IPP WiFi

You will need **smartphones** during this course!

- IPP WiFi:
  - AP: LfE IPP
  - Pass: <!doctype html>
- EDUROAM
  - https://www.lrz.de/services/netz/mobil/802_1x/ipad/

IPP Socrative

- *„Visualizing student understanding has never been clearer“*
- Live quiz during lecture.
- **Room:** IPP

- **Login:** *m.socrative.com*
- **Or App:** *https://itunes.apple.com/de/app/socrative-student*