Praktikum Advanced User Interfaces

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TECHNISCHE UNIVERSITÄT DARMSTADT

Organisation

TECHNISCHE UNIVERSITÄT DARMSTADT

- P4 Praktikum, 6 CP, HCS-Bereich

- Bearbeitung eines praktischen HCI-Projekts:
  - Entwicklung eines interaktiven Computersystems / interaktiver Software
  - Fokus auf Interaktion – gute Programmierkenntnisse werden vorausgesetzt!

- Selbständige Bearbeitung in Gruppen zu 1 – 4 Studierenden

Roadmap

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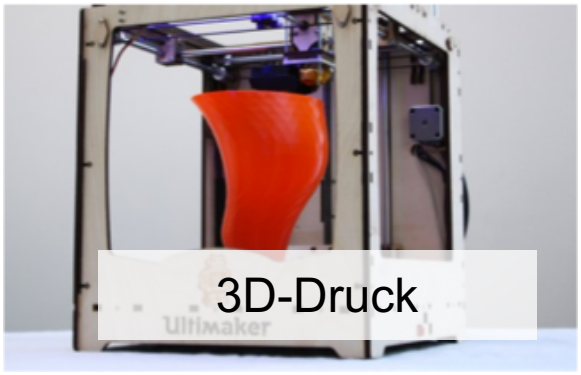
23.10.17	Themenvorstellung & Vorauswahl der Themen/Gruppen
bis Mittwoch, 25.10.17	Mail mit Themen- bzw. Gruppenwünschen (priorisiert) & vorhandenden Kenntnissen: Programmiersprachen, Visual Computing (z.B. AR), Geräte (z.B. HoloLens, Kinect), Frameworks (z.B. Unity, WPF) etc. → Mail an schmitz@tk.tu-darmstadt.de
26.10.17	Verteilung der Themen
Okt. '17 - Mär. '17	Themenbearbeitung (Treffen mit Betreuer bei Bedarf)
10.04.17	Abschlusspräsentation mit Live-Demo (10:00-12:00 in S103 / R.08)

Topic Areas

Augmented Reality

Interactive Tabletops & Walls


3D-Druck

Mobile Devices

#1 Vibrotactile Guidance

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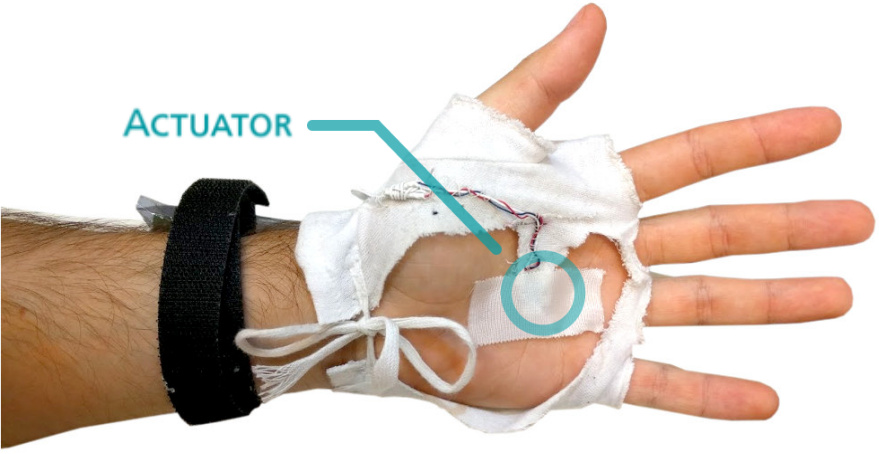
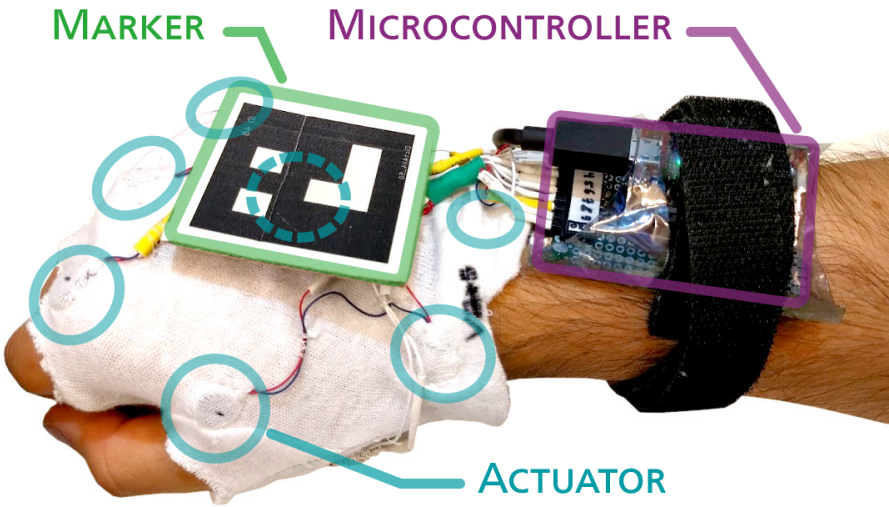
Motivation:
- Find a target without looking

Task:
- Improve existing glove to find a target without looking

Requirements:
- Interested in finding a target without looking
- C# and Arduino would be nice
- Having fun conducting a user study





#2 Pneumatic Haptic Feedback

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Motivation:

- Enable haptic feedback in AR and VR settings

Task:

- Explore different types of pneumatic actuators

Requirements:

- Likes to blow the leaf
- C# and Arduino would be nice

#1 + #2 Vibrotactile & Pneumatic Haptics

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Ansprechpartner

Sebastian Günther, M.Sc.

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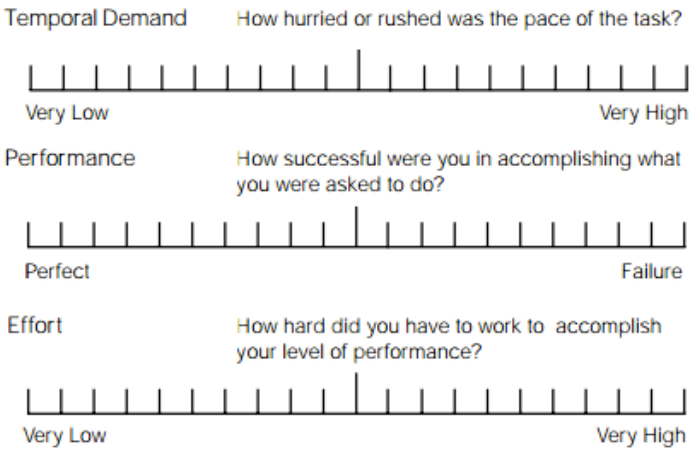
S2|02 A112

#3 Virtual Reality Questionnaires

Problem: When conducting experiments in Virtual Reality, usually questionnaires about the user's task load (NASA-TLX), User Experience (UEQ), Usability (SUS), or presence (PQ) need to be filed by the user in order to rate the Virtual Reality experience. However, these questionnaires are usually on a piece of paper. As this might break the experience, we want to evaluate questionnaires that can be filled directly in Virtual Reality.



Task: Create Virtual Reality versions of established questionnaires (in 2D and 3D)
Requirements: Unity, C#, Virtual Reality

Contact: funk@tk.tu-darmstadt.de

#4 Coffee Assistant v2

Problem

Verwaltung von Kaffeelisten ist aufwendig

- Eintragen in Strichlisten
- Keinen Überblick über den eigenen Kontostand
- Strichlisten müssen per Hand abgetippt werden
- Zahlungen können nur in Bar erfolgen

Hi, I'm Coffee Pi
I'm your new Coffee Assistant. I will replace the tally sheet for coffee billing in the future. You can use your transponder to pay for the coffee and settle your account later using PayPal.
Right now I'm in a public beta test. You are invited to participate! As I'm very new to this, I will probably make mistakes. Mistakes mean free coffee for you. Yiha! If I'm doing something stupid, please contact my parents Martin Schmitz and Florian Müller at {schmitz, mueller}@tk.tu-darmstadt.de.
To get started, just press your transponder. You probably have to try it a few times to find the right spot. It works best at around 10cm to the right of me. After I recognized your transponder, I will show you how you can register with the system. It's super easy!
To pay for your coffee, just press the transponder once. That's it! I will let you know the current balance of your account. You can settle your account at coffee.tk.informatik.tu-darmstadt.de. There you see also your personal coffee statistics! It's super fun!
Coffee Pi
Hello, I'm your coffee assistant.
To pay for your coffee press your transponder once.
Blame
Simons Bikes

-3.00 €
Balance

Direkt zu PayPal

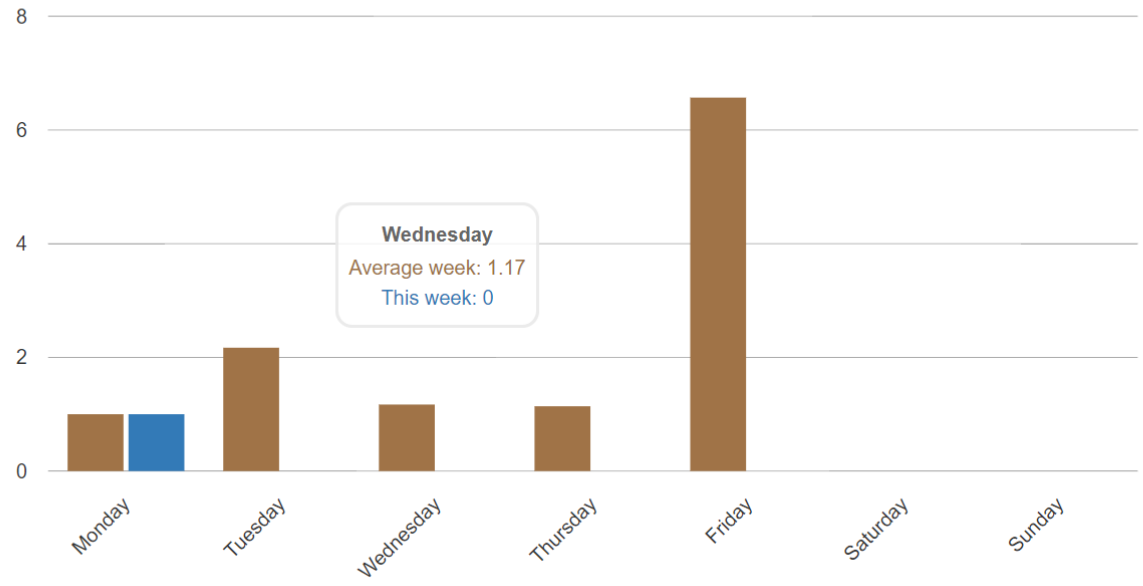
Receive Bill per Mail

The list of my last coffee

« 1 / 4 »

23.10.2017	10:12
20.10.2017	13:38
19.10.2017	13:40 11:14
13.10.2017	17:13 11:01

My coffee consumption this week and that of an average week



October 2017

Mon	Tue	Wed	Thu	Fri	Sat	Sun
25	26	27	28	29	30	1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31	1	2	3	4	5

Average week
This week

Aufgabe

Erweiterung der Web-Anwendung sowie des „Coffee-Pi“.

Ideen:

- Comics
- Stats
- Link/Uhrzeit auf dem Display
- Gewinnspiele
- Küchendienst
- Kaffeemaschine auslesen/ansteuern

Kontakt

Florian Müller

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Büro: S2|02 A 108

#5 Hybrid Detection of 3D-Printed Objects

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Problem: Different Touch Detection Technologies (Infrared vs. capacitive)

Task: Detect the type, position, and rotation of 3D-printed objects on both capacitive and infrared surfaces

Requirements & challenges:

- Programming skills in Windows Universal Apps & Android
- 3D Design and 3D printing of marker objects

Contact: schmitz@tk.tu-darmstadt.de

#6 Capacitive Raw Data Extraction & 3D-Printed Object Detection

Problem: Raw capacitive data **only** available through debug tool (no API)

Task: Extract Capacitive Raw Data from Displax Ultra Touchcontroller to detect 3d-printed objects (or hands, smart devices etc.)

Requirements & challenges:

- Programming skills in Windows
- Reverse engineer USB communication
- Porting a detection of 3D-printed objects from Android to Windows

#7 Magnetic Data Storage in 3D-Printed Objects

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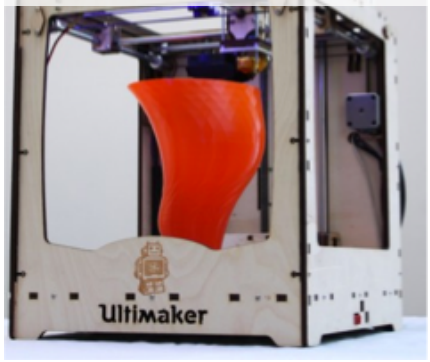
Problem: How to store information in 3D-printed objects?

3D Printer



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Ferromagnetic Filament

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3D-Printed Data Storage

Task: Investigate different ways to store information in 3D-printed objects using a ferromagnetic filament and a smartphone's magnetometer

Requirements & challenges:

- Programming skills in Android
- 3D Design and 3D printing of data storage objects

Contact: schmitz@tk.tu-darmstadt.de