340.027 Project in Pervasive Computing 2015S
First meeting/Introduction

March 9, 2015
S3 0614 (Pervasive Computing Labor)
# 340.027 Project in Pervasive Computing: Points of Contact

## Lecturers

<table>
<thead>
<tr>
<th>Name</th>
<th>Email</th>
</tr>
</thead>
<tbody>
<tr>
<td>Univ.Prof. Dr. Alois Ferscha</td>
<td><a href="mailto:ferscha@pervasive.jku.at">ferscha@pervasive.jku.at</a></td>
</tr>
<tr>
<td>Priv.-Doz. DI Dr. Andreas Riener</td>
<td><a href="mailto:riener@pervasive.jku.at">riener@pervasive.jku.at</a></td>
</tr>
</tbody>
</table>

## Address

Johannes Kepler University Linz  
Institute for Pervasive Computing  
Altenberger Straße 69  
A-4040 Linz  
Phone: +43 (732) 2468 4762  
Fax: +43 (732) 2468 4765  
http://www.pervasive.jku.at  
SCP3 Computer science building, 6th floor

## Secretary

<table>
<thead>
<tr>
<th>Name</th>
<th>Email</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mrs. Angelika Mayr</td>
<td><a href="mailto:office@pervasive.jku.at">office@pervasive.jku.at</a></td>
<td>+43 (732) 2468 4760</td>
</tr>
</tbody>
</table>
### 340.027 Project in Pervasive Computing: General Information

<table>
<thead>
<tr>
<th>Lecture type</th>
<th>Practical</th>
</tr>
</thead>
<tbody>
<tr>
<td>SWS</td>
<td>5 (PR), 7.5 ECTS</td>
</tr>
<tr>
<td>Start</td>
<td>March 9, 2015</td>
</tr>
<tr>
<td>Further dates</td>
<td>by arrangement</td>
</tr>
<tr>
<td>Study plan</td>
<td>Master's program Computer Science 2013W 921PECOPECP13</td>
</tr>
<tr>
<td>Target group</td>
<td>Students of Master CS (major: Pervasive Computing)</td>
</tr>
<tr>
<td>CEUS</td>
<td>Studienhandbuch JKU Linz</td>
</tr>
<tr>
<td></td>
<td><a href="https://lss.jku.at/studienhandbuch/45143">https://lss.jku.at/studienhandbuch/45143</a> (Deutsch)</td>
</tr>
<tr>
<td></td>
<td><a href="https://lss.jku.at/studienhandbuch/45154">https://lss.jku.at/studienhandbuch/45154</a> (English)</td>
</tr>
</tbody>
</table>
340.027 Project in Pervasive Computing: Information (German)

PR Project in Pervasive Computing

<table>
<thead>
<tr>
<th>Workload</th>
<th>Ausbildungslevel</th>
<th>Studienfachbereich</th>
<th>VerantwortlicherR</th>
<th>Semesterstunden</th>
<th>Anbietende Uni</th>
</tr>
</thead>
<tbody>
<tr>
<td>7,5 ECTS</td>
<td>M2 - Master 2. Jahr</td>
<td>Informatik</td>
<td>Hanspeter Mössenböck</td>
<td>5 SSSt</td>
<td>Johannes Kepler Universität Linz</td>
</tr>
</tbody>
</table>

**Detailinformationen**

**Quellcurriculum**

Masterstudium Computer Science 2013W

**Ziele**

Ziel ist die Bearbeitung eines größeren Projekts aus dem Themengebiet des Kernfachs. Studierende sollen damit zeigen, dass sie die Inhalte des Kernfachs in konkreten Aufgabenstellungen umsetzen können. Da das Projekt meist im Team bearbeitet wird, soll auch Projektmanagement und Teamarbeit geübt werden.

**Lehrinhalte**

Selbständiges bzw. Team-orientiertes Bearbeiten eines Projekts aus dem Themengebiet der Kernfachs.

**Beurteilungskriterien**

Werden vom Lehrveranstaltungsleiter (der Lehrveranstaltungsleiterin) zu Beginn des Semesters bekanntgegeben. Im Allgemeinen findet die Beurteilung durch laufende Fortschrittskontrolle sowie an Hand einer Abschlusspräsentation und eventuell eines schriftlichen Endberichts statt.

**Lehrmethoden**

**Abhaltungssprache**

Englisch

**Literatur**

**Lehrinhalte wechselnd?**

Ja

**Äquivalenzen**

INMPPRPECO: PR Praktikum aus Pervasive Computing (7,5 ECTS)

**Präsenzlehrveranstaltung**

**Teilungsziffer**

15

**Zuteilungsverfahren**

Direktzuteilung
340.027 Project in Pervasive Computing: Information (English)

**PR Project in Pervasive Computing**

Unfortunately this information is not available in English.

<table>
<thead>
<tr>
<th>Workload</th>
<th>Education level</th>
<th>Study areas</th>
<th>Responsible person</th>
<th>Hours per week</th>
<th>Coordinating university</th>
</tr>
</thead>
<tbody>
<tr>
<td>7,5 ECTS</td>
<td>M2 - Master's programme 2. year</td>
<td>Computer Science</td>
<td>Hanspeter Mössenböck</td>
<td>5 hpw</td>
<td>Johannes Kepler University Linz</td>
</tr>
</tbody>
</table>

**Detailed information**

- **Original study plan**: Master's programme Computer Science 2013W
- **Objectives**: By working on a non-trivial and coherent project from the area of the Major Subject, students should demonstrate their ability to apply the acquired knowledge from the Major Subject in a practical setting. Since the project is usually done in a team, this course should also practice team work and project management.
- **Subject**: Independent and team-oriented work on a project from the area of the Major Subject.
- **Criteria for evaluation**: The evaluation criteria are specified by the course leader at the beginning of the semester. Usually the course is evaluated by continuous project monitoring as well as by a final presentation and possibly a final written report.
- **Methods**:
- **Language**: English
- **Study material**:
- **Changing subject?**: Yes
- **Corresponding lecture**: [INMPPRPECO: PR Praktikum aus Pervasive Computing (7,5 ECTS)]

**On-site course**

- **Maximum number of participants**: 15
- **Assignment procedure**: Direct assignment
### Project in Pervasive Computing (PR): List of Registrations

<table>
<thead>
<tr>
<th>Nr.</th>
<th>Matrikelnr.</th>
<th>Name</th>
<th>SKZ</th>
<th>E-Mail</th>
<th>Unterschrift</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0855513</td>
<td>Pichler Benjamin</td>
<td>921</td>
<td><a href="mailto:benipichler@gmox.at">benipichler@gmox.at</a></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>1257548</td>
<td>Pipelidis Georgios</td>
<td>921</td>
<td><a href="mailto:pipelides@gmail.com">pipelides@gmail.com</a></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>1357189</td>
<td>Pointner Sebastian</td>
<td>921</td>
<td><a href="mailto:Sebastian.Pointner@gmox.at">Sebastian.Pointner@gmox.at</a></td>
<td></td>
</tr>
</tbody>
</table>
340.027 Project in Pervasive Computing (PR): Schedule, Contents

340.044 PR Project in Pervasive Computing
5 Std./7.5 ECTS, 2015S, Ferscha, Riener
S3 0614 Pervasive Computing Labor

Date 1: First meeting (Introduction) Mo, March 9, 2015 (15:30-17:00), S3 0614

Date 2: „Related Work“/Concept presentation Mo, April 13, 2015 (15:30-17:00), S3 0614

Date 3: Preliminary result (Prototype, demo) Mo, May 18, 2015 (15:30-17:00), S3 0614

Date 4: Evaluation and results discussion Mo, June 29, 2015 (15:30-17:00), S3 0614

Date 5: Write-up of the final report n.n., (end of summer holidays 2015S?)
IEEE CS style, ca. 8-10 pages long
Related work presentation (basic information and hints)

- Slides in english, Presentations in english
- ca. 10 slides, ca. 15 min. presentation time
- Proposed structure
  a) Introduction (what is your topic?), Problems/Open issues, Challenges
  b) „Related work study“
     o Existing solutions? Related approaches in other domains?
     o Was is unsolved, constraints, what is better in my approach (innovation, creativity)?
     o Room for improvements?
  c) Methodology
     o System concept/design (considerations: why this way?)
     o Research questions/hypotheses
     o Innovation and creativity is appreciated!
  d) Identified (or expected) problems, how to solve? (e.g., how to compensate for sensor drift, inaccuracy of GPS), non-existing hardware, firmware problems, „beta“ channel/program)
     o Think about potential issues very early in the design phase!
     o Discuss about alternatives or ways out...
  e) Time plan, Design of user study (quantitative/qualitative, lab/field, etc.)
Project in Pervasive Computing

List of Topics
340.027 Project in Pervasive Computing: **Attention Estimation**

**Public Displays: Pose/Gesture Tracking via Depth/RGB streams**

- Behavior Analysis
- Body Pose Analysis
- Head Pose Estimation

**Behavior Description**
- Speed / Acceleration
- Direction / Orientation
- Taken Path / Detours

**Classification**
- Machine Learning algorithms (SVM) used for training and classification
- Real-time classification of overall and current attention values

**Contact:** A. Ferscha
340.027 Project in Pervasive Computing: **Attention Estimation**

**Public Displays: Eye Tracking via Mobile (SMI 2.0, Google GLASS)**

- Eye Gaze Features
- Fixation
- Saccades
- Mapping of Scans to Content
- Online Annotation of Content
- Online Recommender Coupling
- Reading Experience Classification
- Typology of Readers

**Classification**

- Machine Learning algorithms (SVM) used for training and classification
- Real-time classification of overall and current attention values

**Contact:** A. Ferscha
340.027 Project in Pervasive Computing: Subliminal Perception

Subliminal advertising: „Display overlay driver“

Problem definition, Approach

- (Visual) information overload is a topic of increasing importance. In this project, the influence of information transmitted in a subliminal manner should be investigated.
- Information, if displayed/flashed for only very short time (< 20ms; =subliminal) cannot be consciously detected/„seen“ by the eye, but is recognized by the brain (electrical stimuli).
- To study this effect, an interface is required allowing for overlaying different types of information to normal screen contents (Webbrowser, Email-client, Word/Excel), and for measuring differences in their use with/without subliminal information.
340.027 Project in Pervasive Computing: Subliminal Perception

**Subliminal advertising: „Display overlay driver“**

**Expected outcome**
- Sort of plugin allowing to define content (text, basic structures, photos), overlay it to normal screen content, and record differences in person behavior (e.g., keystrokes, reading behavior in online media (eye tracking), level of mental load (ECG measures), reaction time, questionnaire about content they can remember, etc.)
- Addressed display types, e.g., computer screen, large (e.g. 46") display, iPad

**Prerequisites**
- Interest in software/prototype development (Java, C/C++/C#)
- > excellent programming skills in OpenGL (shader programming, multitextures) required
- Good command of English
- Typesetting using LaTeX + BibTeX

**Bibliography**


**Contact**
- A. Riener
A7 express highway: Usefulness of section control on traffic safety

Problem definition, Approach

- Comparison of traffic flow on the A7 highway before/after the installation of the section control.
  - aspects: fluidity of traffic, road safety, necessity for the section control in off-peak times, etc.
  - concrete task(s) to be identified in a meeting with the highway operator ASFINAG

- Modeling of the road segment of interest in VISSIM; advance the simulation based on real traffic data (maybe: connection to road sensors in real time?)

Prerequisites

- Interest in software/prototype development (Java, C/C++/C#)
- Interest in traffic simulation (using VISSIM, see: http://vision-traffic.ptvgroup.com/de/produkte/ptv-vissim/)
- Good command of English
- Typesetting using LaTeX + BibTeX

Contact

- A. Riener
340.027 Project in Pervasive Computing 2015S
First meeting/Introduction

March 9, 2015
S3 0614 (Pervasive Computing Labor)