Multimodal Human Machine Interaction - design and applications

Prerequisites:

Methods in CL 1

Programming skills are highly recommended

Course Description & Objectives

A multimodal user interface for devices requires the integration of several recognition technologies together with sophisticated user interface and distinct tools for input and output of data. Multimodal interaction provides the mobile user with new complex multiple modalities of interfacing with a system such as: speech, gestures and movements, touch, type and more.

The course discusses the new world of multimodality User Interface, the technologies and design which are innovation and create a stat of the art user interface. We will discuss the commercial challenges and try to offer new approaches to these issues. The objective of the course is to expose the students to state of the art multimodal user interface technologies and to have them face design challenges so they will become familiar with the area of Mobility and Multimodality both from the technological aspect and from the usability aspect.

Student will be required to suggest and design the architecture and dialog flow for a multimodal application. The design plane will be done using the tools and best practices acquired in the class.

Methods of Instruction

Lecture with some practical classwork

Course requirements:

Attendance. 80%

Participation. in class activities

Timely completion of all written assignments.

Suggested Lecture topics by weeks *

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic(s)</th>
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<tbody>
<tr>
<td>1</td>
<td>Intro Multimodality – Scope &amp; Definition</td>
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<tr>
<td>2</td>
<td>The development Smart interaction timeline history</td>
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<td>3</td>
<td>Why going multimodal?</td>
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<tr>
<td></td>
<td>• Technology availability</td>
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<td>• Users demands</td>
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<td>• Market forces</td>
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<td>4</td>
<td>Multimodal system architectures:</td>
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I/O Technologies, Sensors, Data

5 Multimodal system architectures:
Structure drill down

6 Which technologies used in the mobile interaction:
Traditional, Advances, Creative

- Mouse, Display, Key DTMF
- Touch, Voice (ASR, TTS), Face Recognition, Gyro - Tilting/shaking
- Digital pen, Voice biometrics SV, SI, Gesture Recognition
- Emotion Detection, Eye tracking etc

7 Which technologies used in the mobile interaction: (cont.)
Traditional, Advances, Creative

8 Final project planning – class work

9 Design implications of multimodality in applications
Part A – Integration & Deployment issues

- Infrastructure
- Robustness
- On line access
- Standardization

10 Design implications of multimodality in Mobile application
Part B – MMI: User interface, User Experience, Tools

11 Scenario planning – class work

12 Multimodal applications in the real world

13 Multimodal applications and products in the mobile environment

14 Usability testing & Quality Assurance methodology

15 Projects Presentations

Grade Components:

<table>
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<tr>
<th>Task</th>
<th>Midterm Presentation</th>
<th>Final paper *</th>
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<td>40%</td>
<td>60%</td>
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*Students will be required to hand in the final paper in parts during the course.
Course Bibliography

1. Course text book:


2. List of current Articles – will be published