Course Description

Interaction Design

Contents

The Big Picture

Terry Winograd [1] describes Interaction Design as follows: "…the design role is the construction of the interspace in which people live, rather than an interface with which they interact…".

Designing for live means designing interactive systems (products/services) so that they can employ those systems across different locations/places, situations/time and technological platforms/devices. Therefore the Design aims at enriching people's live within different contexts and to satisfy specific worths/values.

Interaction Design is both: analysis and creative synthesis. The relevant issues are people, their objectives (motivations, goals, tasks), their contexts (psychological, physical, cultural, social, organisational, economical, etc.) and the available (or emerging) technologies. Interaction Design has to cover a holistic approach on the design objectives but has a clearly marked checkpoint: the worth/values, that are considered as being relevant. Interaction Design utilises concepts, methods and techniques from Design Theory, Human-Computer-Interaction, Creativity Techniques as well as sketching and assessing techniques.

Intended Learning Outcomes

The participants are capable of

- debating and applying *user centered design/applied arts/engineering design* methods and techniques,
- conceptualising an interaction design for web based systems or services and creating conceptual design prototypes that adhere to given constraints (e.g. requirements),
- identifying metaphors from the application domain that potentially support users in interaction with the system,
- knowing a systematical approach of "conceptual design" and being able to apply it to a given design problem,
- choosing appropriate interaction-paradigms, -styles and -modes for their interaction design project,
- criticising a design based on relevant design qualities (such as functional, structural, aesthetical, economical, social, ecological, cultural, ethical...) and
- presenting and advocating design proposals to a critical audience.

Structure of the Course

Introduction To Interaction Design

Interaction Design is introduced according to the views of Terry Winograd, Jon Kolko [2] and the perspectives of Löwgren & Stolterman [3].

Cognitive Psychology

We discuss relevant issues in regards to cognitive psychology to enrich the human perspective. Therefore we take elements of problem solving, creativity and perception[4] into account. We consider problem solving as a set of activities and we discuss conditions, implications, constrains and possible benefits. We emphasize certain concepts such as mental problem representation and cognitive styles, human problem solving strategies such as algorithms, heuristics or analogies, and functional or feature fixations. We introduce and discuss the term: creativity from a psychological point of view and relate these topics to the discipline of interaction design. In addition we consider perceptional aspects, especially the ecological approach, namely: **Affordance** (according to Gibson and the late Hartson[5]). The notion of affordance provides a powerful concept for design and evaluation of design artefacts.

Conceptual Design

Interaction design is a human-centered design process since it starts with human needs and their activities. This comprises activities, concepts, methods and related analysis-, modeling- and synthesis-techniques as stated in the ISO-EN-DIN standard 9241, part 210. [6]

Prior to a concrete User Interface Design we introduce the notion of a **Conceptual Design** [4] which is (the sometimes missing) link between requirements and concrete design solutions. We

will choose a case study and then carry out a conceptual design in order to enhance hands-on-competencies.

Creativity Techniques

We elaborate and debate a set of selected creativity techniques (such as: 635-technique, KJ-diagrams, morphological box, six thinking hats, reframing, 180 degree[7].) to support analysis AND design activities. We contextualize these techniques according to certain stages in a problem solving process and elaborate on how they can support and enhance the human performance in problem solving and creativity.

Design Principles, Design Qualities AND Design Rationale

What are relevant principles[8] and qualities[7] in the context of designing artefacts and services? We deal with some of these high-level objectives and discuss how to apply them. The development and specification of a concrete interaction **Design Rationale** [9] is practiced.

Interaction Paradigms, -Styles and -Modes, Metaphor Engineering For The Web

Paradigms [10] for the interaction between humans and computers as well as metaphors [11] provide domain-dependent semantical frameworks for designing [12] and (intuitively) carrying out interaction. Interaction styles describe how the "dialog" between humans and technical systems takes shape at the interface. We discuss relevant concepts, their application in web projects and metaphor engineering critically.

Sketches, Scribbles, Mockups, Prototypes, Storyboards, Wireframes...

We are going to do as much design practice as possible in order to elaborate our design competencies as well as our **Critical Judgement**. Contemporary design studies will enrich our understanding of highly efficient design activities [13].

Evaluation Methods And Techniques

Wether all design objectives are sufficiently addressed has to be assessed by means of evaluation activities. We discuss evaluation methods and techniques[14]. The relevance of certain concepts such as *formative* and *summative evaluation*, *qualitative* and *quantitative data*, *in-vivo* vs. *in-vitro* evaluation techniques is discussed in detail. We discuss how the planning and executing of evaluation adheres to certain aspects, such as the projects *high-level objectives*, scientifical aspects concerning the *measurement* or *available resources*. Last but not least we deal with questions concerning the processing of data, the interpretation of outcomes and the preparation for further activities in the design process.

Didactic Concept, Schedule and Assignments

The course concept comprises basic readings, online workshops, online group work and an introductory and final on site presence. After a first introductory lecture on site, the subject is

treated in three online workshops, that are supplemented by a session on site. Online workshops are held on three evenings with a duration of three hours each.

Introductory lecture on site

The introductory meeting deals with organizational course details, a workshop to address basic concepts of interaction design and to clarify unresolved questions.

1st Online Workshop

This workshop consists of two phases: The first part is held in a seminar-like form. The subject of this workshop (interaction design as a process, according to Löwgren & Stolterman) is, based on the basic readings, presented in a highly interactive matter, open questions are discussed with the lecturer and among the students. For the second phase students form groups and choose a Case Study, and start developing a Conceptual Design for it.

2nd Online Workshop

The second workshop will deal with the design rationals, as introduced in the basic readings. The groups will proceed their Case Study by creating and refining a Design Rational for the Case Study.

Based on the Conceptual Design, the groups proceed in online work groups to specify the interaction paradigm, -style and -modes of their interactive system, they design metaphors and specify physical, sensory, functional and cognitive affordances of interaction objects for an interface prototype. They specify and sketch functional, structural and other design qualities of their interactive system. The session ends with a plenar online meeting where the groups present their findings and open issues are clarified with the lecturer. The participants continue their group work during the 2nd and 3rd online workshop.

3rd Online Workshop

This session starts with status reports of each group including concepts, schedules and sketches of their interactive system as well as informations about design decisions, trade-offs and so forth. After this open questions about the basic reading of reference 13 (Evaluation) may be clarified with the lecturer. We proceed with continued group work by deriving evaluation methods and techniques from the group's higher level objectives of their interaction *design rationale*. During the 3rd online workshop and the wrap-up session the group executes the evaluation of their prototypes and documents the outcomes for presentation during the wrap-up session.

Wrap-up Session On Site

This on site workshop is dedicated to present the evalution findings in plenar form, clarify open questions of the students concerning evaluation as well as other course issues and to summarize workshop content. The wrap-up session is also used to accomplish the written examination (45 minutes).

Examination

The participants chose a Case Study and apply the concepts and activities which are discussed in the onsite- and online sessions. The students set up a work folder (or work book) and append their artefacts (written documents, design artefacts, ...) into the folder. The final grade for the course will be based on the group work document and the individual work folder. Every group's document is accompanied by a matrix showing who did what to which extend.

References

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