Aalto University
School of Science
and Technology

USchool Intro

Introduction of USchool at Aalto SCI

http://uschool.aalto.fi/

Prof. Marko Nieminen
Usability and user interfaces
Department of Computer Science

Themes for Today

- Introductions – USchool: staff and students. Multi-disciplinary groups.
- USchool: Themes and topics. What is USchool and what kind of courses does it offer?
- On Human-Computer Interaction and User-Centred Design
- Group Assignment 1: Analysis of interaction with improvement recommendations

USchool Personnel

- Aalto SCI
  - Prof. Marko Nieminen
  - Senior university lecturer Mika P. Nieminen, D.Sc.(Tech.)
  - Study coordinator Anu Kuusela
- Aalto ARTS
  - Prof. Virpi Roto
  - Study coordinator Meri Arnala
- Cognitive Science / University of Helsinki
  - University lecturer Anna-Mari Rusanen, PhD
  - University lecturer, docent Otto Lappi, PhD

Students and Groups 2023

1:

Anh Ngo (ARTS)

Ella Anttila (SCI)

Anh Nguyen (UH)

Yikun Wang (ARTS)

Matti Piispanen (UH)

2:

Poonam Chawda (ARTS)
Lian Baiyi (UH)
Gladys Suryana (ARTS)
Emili Segulja (UH)
Aino Hukkanen (ARTS)

3:

Yan Zhang (ARTS)
Zhongchan Chen (UH)
Ruth Kupiainen (ARTS)
Tuomo Kamula (UH)
Pia Johansson (ARTS)

USchool

- The students of USchool get advanced education in user-centred design
- The university units and study programmes that provide the foundation for USchool are
  - **Department of Computer Science and Engineering**, Aalto University, School of Science (SCI)
  - **Department of Design**, Aalto University, School of Art, Design, and Architecture (ARTS)
  - **Cognitive Science,** University of Helsinki
- Five students from each founding study program are selected and enrolled based on special applications
- Students are given a two-year permission to complete their courses in USchool

USchool: A Multi-Disciplinary and Collaborative Study Program

- How do **people** perceive and **experience** the products and **services** that they use?
- Usability research, user-centred development, user experience research, user interface design, service design
- Multi-disciplinary research: methods from different scientific domains:
  - Cognitive science
  - Industrial design, graphical design
  - Computer science, software engineering, interaction technology, information systems
  - Human-Computer Interaction (HCI), user-centred design, user interface design and implementation, product development

- Usability school prepares participants for work in **a multi-disciplinary development environment**: skills for inter-disciplinary discussion

Characteristic to USchool Studies

- Exercises and multi-disciplinary teamwork!
- Qualitative research, methods
- Projects and assignments typically carried out in real-life (industrial / public service) environment.

Concepts and Topics

- Human-computer interaction
- User experience
- User-centred design
- Human-centred design
- Usability
- User interface design
- Usability evaluation
- Interaction design
- User value
- Participatory design
- Co-design
- Service design
- Context-of-use
- Contextual design
- Ethnography
- Action research
- Design science
- …

Skills and Experience: Expectations from Industry

- Technology, ”construction skills”; interest and ability to develop in this
- Basic understanding of cognitive psychology
- Understanding the importance of aesthetics in user interface
- Facilitation of workshops (user/customer/personnel/development/focus)

- Methodological skills in addition to usability evaluation:
  - Focus groups
  - Concept design
  - Gathering of user requirements and translation for engineering
  - ”Thorough ability to use and apply at least one of the methods”
- Ymmärrettävän suomenkielisen tekstin tuottaminen / Ability to produce comprehensible written reports in required natural language (!C# || awk)
- Interaction skills with other developers and designers (engineering / design) as well as with marketing and other – even unexpected stakeholder groups

”So, what am I gonna be?”

Some Job Positions and Titles (N=103)

- UX designer, UX manager, UX specialist (23)
- CX Consultant, CX designer (4)
- Interaction designer (4), Service designer (2)
- Software developer (6), Web developer, Front-end developer, Lead full stack developer, Functional architect (2), Test engineer (2)
- Project manager (7), Project engineer (1), Development manager (2)
- Researcher (7), Research manager (2)
- Product manager
- Game producer, Game designer
- Design lead, Head of design, Lead product designer
- Communication designer
- Business/BI analyst, Business consultant, managing consultant
- CEO, CTO, Director of business development
- Country manager
- Co-founder
- Airline pilot

UCD Courses at Aalto SCI 1/3

- **User-Centered Methods for Product and Service Design** 5 cr (M.Sc.) (~100 students)
  - The course **introduces the commonly used user-centred user research methods** for early-stage product and service design and provides tools to analyze and visualize the gathered data to fuel product and service design.
  - After the course, **you know the basic methods for user research**. You understand and can describe different methods for use in the beginning of the user-centered design process and select appropriate methods for a given user research problem. You know how to apply a number of methods in a simple user research case. You will be able to find and analyze relevant new information in the field and concisely present research results to an audience.
  - You are comfortable with reading academic articles and will be able to write and reference an academically paper properly.

UCD Courses at Aalto SCI 2/3

- **User Interface Construction** (5 cr) (M.Sc. ~80 students)
  - The **design and construction of user interfaces,** emphasis on technical aspects and prototyping. Use of basic user interface elements for construction with style guides. As a result, students are able to develop an interactive user interface that can be used for usability testing. Students know how to apply user-centred design principles, guidelines, and patterns in the design and implementation of interactive user interfaces.
- **Collaborative Evaluation of Interactive Systems** (5 cr) (M.Sc.) (~25 students)
  - The course introduces several **methods for collaborative evaluation of interactive systems**. The methods for evaluation of usability and user experience are applied in project works conducted in cooperation with customers. Findings further the development of the evaluated interactive system or service.
  - After the course, you can select methods for collaborative evaluation of usability and user experience. You are able to **design and carry out an evaluation of interactive systems** in different contexts. You know **how to communicate your results** to various stakeholders in order to **impact the further development of the system or service**.

UCD Courses at Aalto SCI 3/3

- **Data-Driven Concept Design** (M.Sc. ~60 students)
  - How to create product and service concepts? How to prepare and analyse common user research data to produce relevant user knowledge for data-driven design? How to develop select parts into visualised prototypes of various fidelity?
  - As part of a team, students apply creative problem-solving methods in a rigorous manner to find innovative solutions based on demonstrable potential and limitations. Students present the designs and argue the design decisions in a clear and concise manner to various stakeholders.
- Seminar in Software and Service Engineering (M.Sc.+)
- Research Seminar on Software Engineering (M.Sc.+)

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HCI – Human-Computer Interaction

A very short introduction

ACM SIGCHI / HCI Curricula

(ACM 1992, 1996)

- HCI – Human-Computer Interaction
- ACM – Association for Computing Machinery
- SIGCHI – Special Interest Group on Computer-Human Interaction

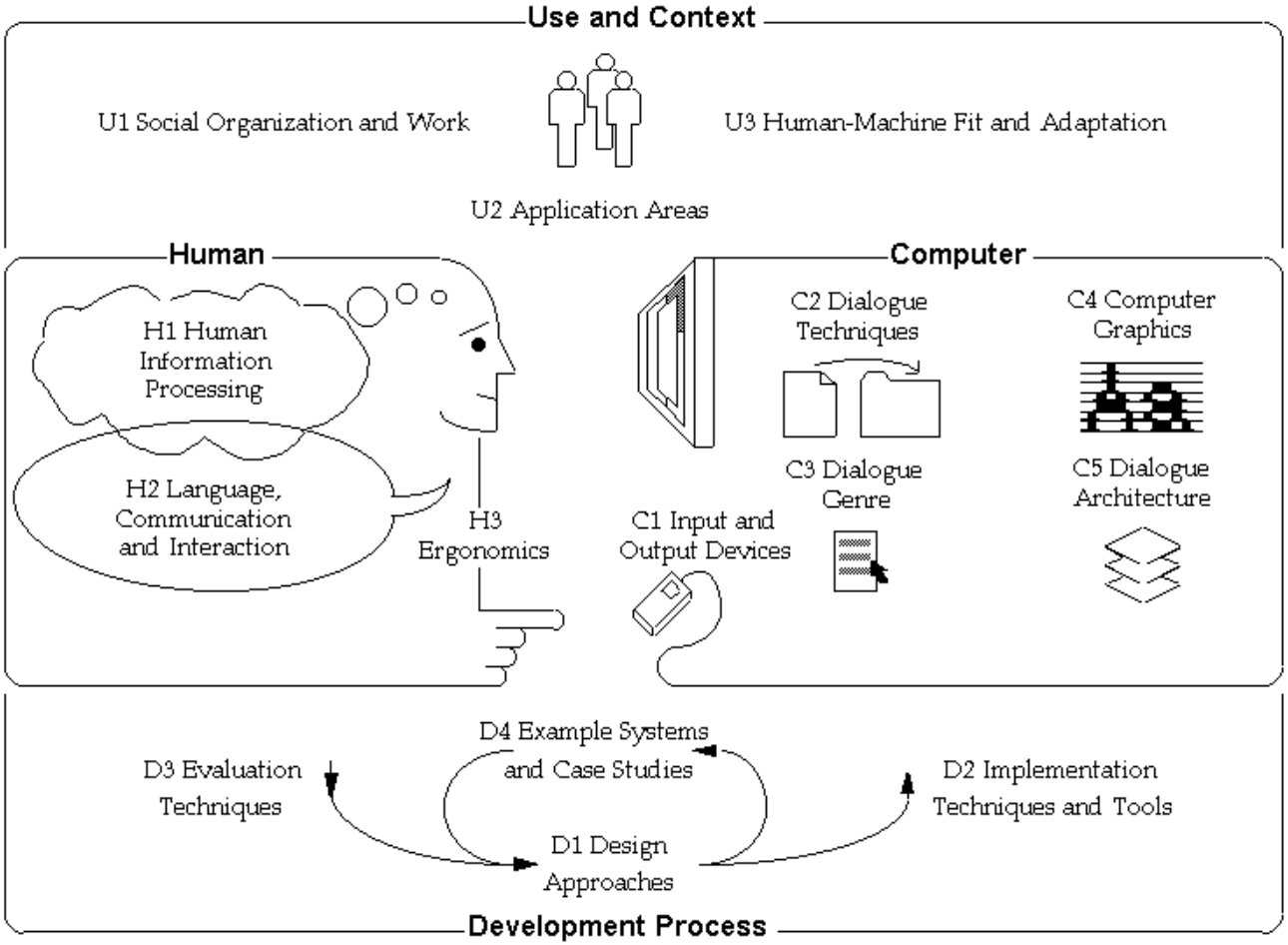
- http://www.acm.org
- http://www.acm.org/sigchi/cdg/index.html

HCI & Community

(ACM HCI Curricula 1992, 1996)

- **Organizations**
  - The ACM Special Interest Group on Computer Human Interaction SIGCHI
  - The British Computer Society Specialist Group on HCI
  - The IFIP Technical Committee (TC 13) on Human-Computer Interaction
  - The Human Factors Society Computer Systems Technical Group
  - The European Association for Cognitive Ergonomics
- **Journals**
  - Human-Computer Interaction
  - International Journal of Human-Computer Studies
  - Behavior and Information Technology
  - International Journal of Human-Computer Interaction
  - Interacting with Computers
- **Conferences**
  - ACM CHI Human Factors in Computing Systems Conference (CHI)
  - IFIP INTERACT Human Factors in Computing Conference (INTERACT)
  - Designing Interactive Systems (DIS)
  - NordiCHI, Mobile HCI
  - ACM User Interface Software Technology Conference (UIST)
  - BCS HCI SG Human-Computer Interaction Conference (HCI)
  - European Conference on Cognitive Ergonomics
  - International Conference on Human-Computer Interaction (HCII)

ACM SIGCHI – Human Computer Interaction, trad.



http://www.acm.org/sigchi/cdg/figure_1.gif
ACM SIGCHI Curricula for Human-Computer Interaction

Topics of Interest

(Churchill & al. 2016)

- Interaction design
  Cognitive science, computer science (general), design (general), digital media, information science, psychology (general), sociology, statistics
- Experience design
- Desktop, mobile, tablet
- Gesture, keyboard, sensor, touch
- Agile/iterative design
- Participatory design
- Value-centred design

- Brainstorming
- Field study / etnography
- Prototyping: Interactive hi-fi & paper-based lo-fi
- Interviews
- Observation
- Scenarios, storytelling
- Surveys
- Usability testing, thinking aloud
- Qualitative and quantitative research methods
- Data analysis
- Experimental metods

CHI 2021: Some Themes (”Sessions”)

https://dl-acm-org.libproxy.aalto.fi/doi/proceedings/10.1145/3411764

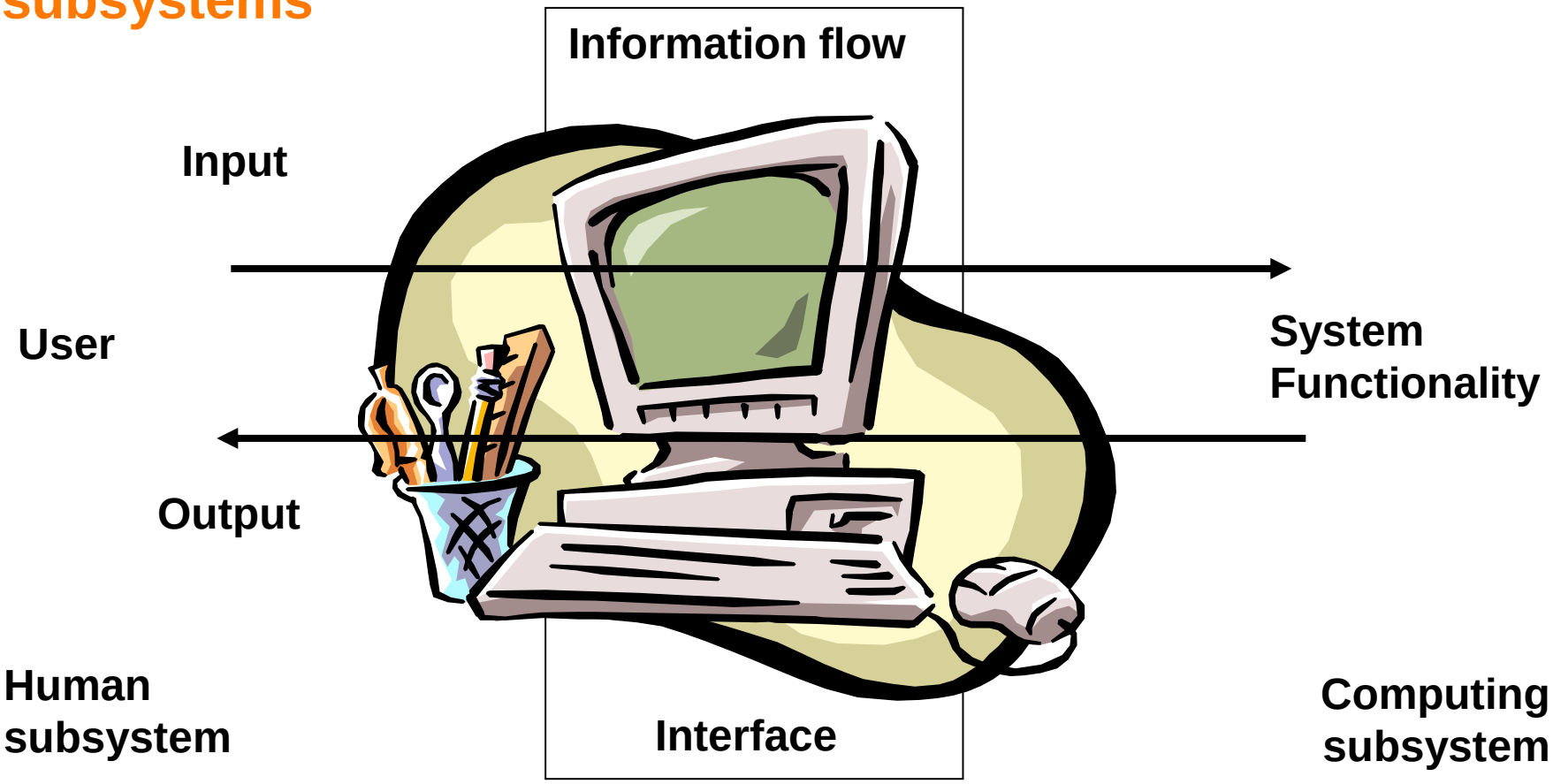
- SESSION: Vision and Sensing
- SESSION: Designing Effective Visualizations
- SESSION: Access for People with Visual Impairment
- SESSION: Tech for Specific Situations
- SESSION: Education
- SESSION: Privacy Design
- SESSION: Computational AI Development and Explanation
- SESSION: Technology Resistance/HCI and Distinct Populations/Queering Technologies
- SESSION: Engineering Interactive Applications
- SESSION: Game Design and Player Experience
- SESSION: AR and VR
- SESSION: Cross-cultural Design / Reflection, Design, & Participation
- SESSION: Human-AI, Automation, Vehicles & Drones / Trust & Explainability
- SESSION: Care(ful) Design / Other Worthy Topics
- SESSION: Trust, Transparency & Sharing Online
- SESSION: Interaction Techniques / Sketch and Illustration / Privacy
- SESSION: Personal Health Data
- SESSION: Haptics
- SESSION: Health & Behavior Change
- SESSION: Human, ML & AI
- SESSION: Meetings, Chats, and Speech
- SESSION: Design and Bodily Action
- SESSION: Accessible Content Creation
- SESSION: Computational Physical Interaction
- SESSION: Transformation and Sustainability / Activism and Critique
- SESSION: Engineering Development Support
- SESSION: eSports, Streaming, Social Play
- SESSION: Affection and Support in a Digital World
- SESSION: Remote / Kids
- SESSION: UX and Interaction Design and Research: Techniques, Insights & Prototyping / Reflection, Behavior, Change & Learning
- SESSION: Understanding Accessibility
- SESSION: Computational Human-AI Conversation
- SESSION: HCI Confronting Issues of Race, Genders, Feminisms, Reproductive Health
- SESSION: Engineering Real-World Interaction
- SESSION: Design Tools / Machine Learning / Fabrication / Visual Artifacts in Design and Ideation
- SESSION: Virtual Reality, Embodied Experiences, Toxicity
- SESSION: Combining Digital and Analogue Presence in Online Work
- SESSION: Novel Visualization Techniques
- SESSION: Tech for Learning and Families
- SESSION: Accessible Interaction
- SESSION: Wearables, Tangibles, and Fabrics
- SESSION: Video, XR, Perception, & Visualization

CHI 2021: Some Themes (”Sessions”)

https://dl-acm-org.libproxy.aalto.fi/doi/proceedings/10.1145/3411764

- SESSION: XR/VR/360°
- SESSION: Mental Health
- SESSION: Privacy Behaviors
- SESSION: Various People
- SESSION: Computational Design
- SESSION: Justice / Critical Reflections on the Field / The Art of Making
- SESSION: Understanding Visualizations
- SESSION: Design Methods / Speculative Futures / Performance / Gustation
- SESSION: Design for Public Spaces / VR Memorials / Textiles and Jewelry / Voice and Conversation / New Value Transactions
- SESSION: Mobile Studies, Mediation, & Sharing / COVID-19 Pandemic Response
- SESSION: Clinical Support
- SESSION: Fabrication
- SESSION: Systems for Learning
- SESSION: Developers / Authentication / Privacy Risks from Children to Adults
- SESSION: Justice, Wellbeing, and Health
- SESSION: Smart Home, Bot, Robot, & Drone / Input & Measurement
- SESSION: Augmented Reality / Interacting with Text & Notes
- SESSION: Input / Spatial Interaction / Practice Support

Interacting with [put the name of the object here]
User Interface: Mediator for the Input / Output between subsystems

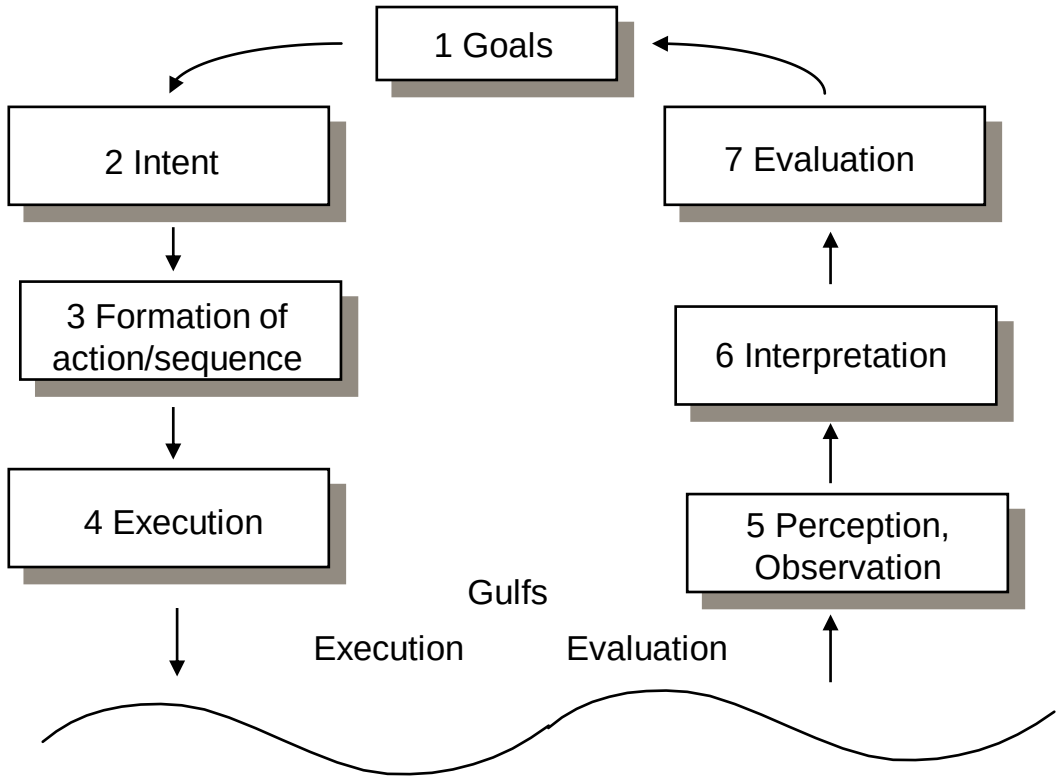


Assignment: Analysis of Interaction

in Multi-Disciplinary Groups

- Form the multi-disciplinary groups!
- Assignment: analyse interaction
  - Observe your surroundings for sub-optimal functionality
  - Select an interesting case to study in detail
    - First: Based on your existing background
    - Then: Familiarize yourself with the Norman's model (next slide)
  - Analyze user interaction with the object/device/app/service:
    - What are the challenges?
    - How does the user perform? How to do a breakdown of activities for analysis? Based on your existing background? How does Norman's model inform you?
    - Any ideas on improvements?
  - Create a synthesized analysis & conclusion in your group
    - **To be presented next time at the SCI meeting**

Interaction with UI: Seven Stages



Norman 1986