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Teaching Human-Technology Interaction students to design AI applications in a multidisciplinary context

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7.7.2020 CHI Italy workshop on “Teaching HCI for AI: Co-design of a Syllabus”

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Contents

- What is specific about HTI with AI applications?
- Our syllabus proposal
- What are design, development and user testing methods and practices available in HCI that could be adopted in AI?

Special characteristics of AI applications

- Increasing system **agency,** levels of **automation** and **proactivity**
- **Uncertain, non-transparent**: “Black boxes” – “Magic”
- AI apps **evolve** and **learn** from the user and the context
  - **Improve over time** with data and actions
- Diversity of interaction paradigms for **human-AI collaboration**
  - Operate on different forms of **usership** and **stakeholders**

▻ *A broad range of **ethical** and **interaction design** issues*

https://cars.usnews.com/cars-trucks/autonomous-vehicle-levels

https://mashable.com/

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Rationale behind our HCAI syllabus proposal

- To form solid **basis for interdisciplinary collaboration on design and development of AI applications** and systems that take into account the human stakeholders' needs
- To provide **skills on using concrete methods and tools for the design and development of AI apps** that provide **positive user experience** and follow **ethical principles**
- To **bridge the gap** between **design thinking** and the more **technical skills & knowledge**

Our syllabus draft for Human-Centrered AI

Target groups: Students of HCI & AI

I INTRODUCTION TO HCAI (5 cu)

Basics of Human-Centered AI (HCAI)

- Definitions of AI and HCAI
- Example systems (and their advantages & problems)
- HCAI characteristics - "AI UX goals"
- Different forms of being an AI "user", e.g. Human-AI partnering
- Ethical principles
- Exercises, readings

Multidisciplinary collaboration between technical and humanistic AI professionals

- Roles of technical, human sciences, design, philosophy/ethics professionals, and how they can effectively communicate and work together in groups
- Common concepts
- Collaborative frameworks for multiple disciplines
- Processes & concepts -> methods that fit different disciplines' ways of working

II AI TECHNIQUES (5 cu)

AI techniques and how they appear in applications/systems

- Machine Learning "for dummies"
- Techniques for Intelligent User Interfaces (NLP, machine vision, etc.)
- Role, uses and gathering of (high-quality) data

III DESIGNING HCAI (5 cu)

Design approaches

- Overview of suitable human-centered design approaches; underlying principles and how they may fit AI applications' special charactersitics
- Value-Based Design, Experience-Driven Design, etc.
- Design and evaluation methods and tools
- Design methods applied to AI applications: Customer Journey Map, experience canvases, UX goals, ...
- Evaluation methods: Wizard of Oz, large scale online surveys, ...

IV PROJECT WORK (5-10 cu)

Hands-on project in an interdisciplinary team, from a topic provided by an industrial company or a research group

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Panel 2: The HCI competences the AI specialists should have in order to design AI systems that are beneficial to human beings.

Questions to be answered:

* What are the interaction paradigms /modalities/metaphors for AI systems that best support the interaction with users?

* What are examples of failures of AI systems due to poor knowledge of HCI theories, principles, and methodologies?

* What are design, development and user testing methods and practices available in HCI that could be adopted in AI?

* What theories and design methodologies should be used for creating AI systems that best empower people?

Design approaches for HCAI

Principles

- AI designers need competences that allow them to **holistically reflect on the values and assumptions underlying** the proposed solutions
- Approaches should help
  - **elicit discussion on designers' responsibility** with the help of speculative artefacts
  - conceive **artefacts that are capable of communicating ideas** with psychological and ideological weight
  - **envision alternative socio-technical futures** where AI technology can impact different behavioral, cultural and societal dynamics
- Approaches should provide tools for **thinking creatively and being ethical** on why and how we design things

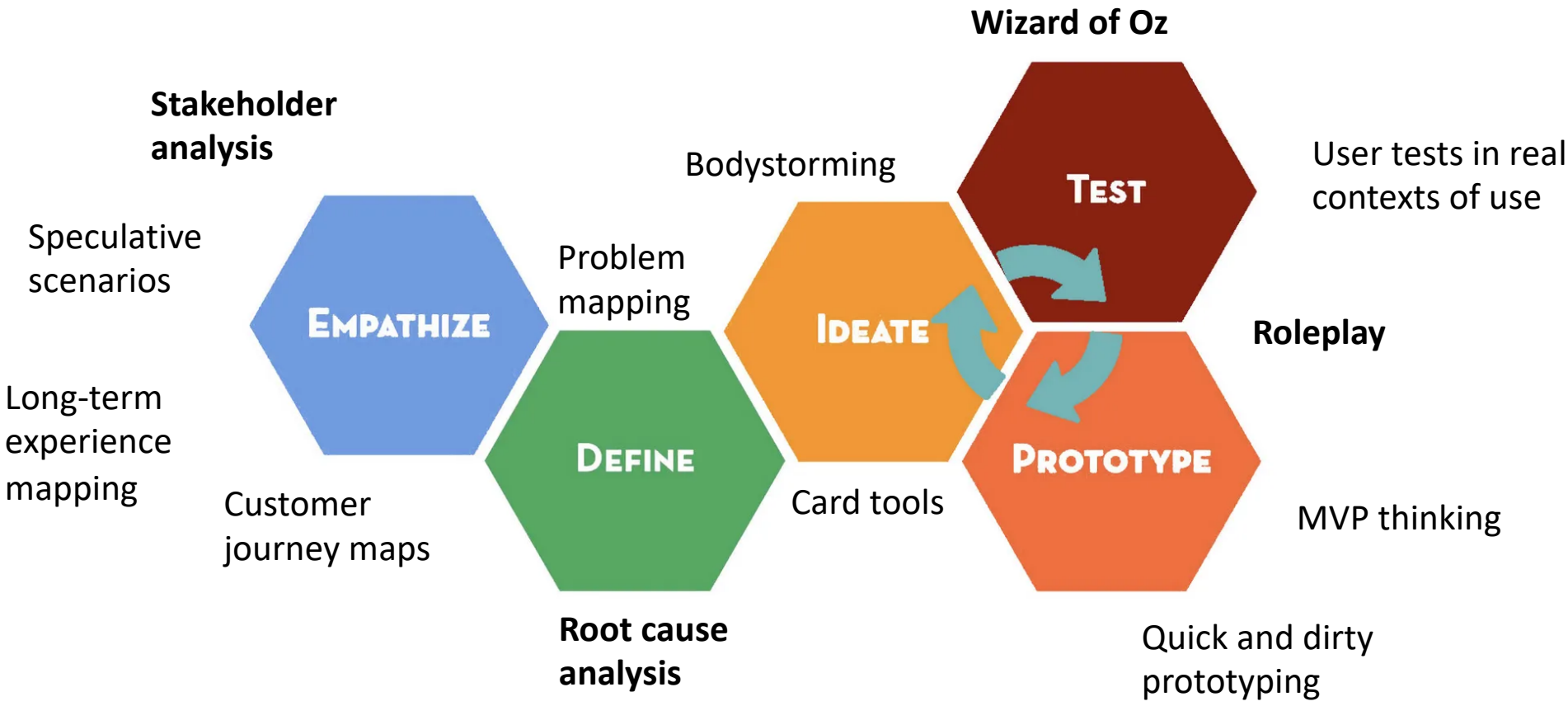
Possible approaches

- value-sensitive design [6]
- critical design [7]
- sustainable design [8]
- speculative design [9]
- socially responsible design [10]

➢ ***Broad and deep design thinking***

➢ ***Following "normal" HCD principles***

HCAI design methods – *examples*



*Chosing and **adapting methods** to take into account the **specific AI characteristics**: Agency, uncertainty, evolving nature, and diverse forms of human-AI collaboration*

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Thanks!

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"The AI system must continually improve by learning from humans while creating an effective and fulfilling human-AI interaction experience." (https://hcai.mit.edu)