

# Oi Dialogoi for Human Centred AI

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**Issues and related workshop questions.** What are examples of AI systems that pose problems to the users, such as ambiguities that confuse users, lack of control, lack of trust,... What are examples of failures of AI systems possibly due to misapplications of HCI theories, principles and methodologies?

Current AI systems disclose diverse possibilities for humans. Suffice it to think of the COVID-19 pandemic and the potentials of AI for tackling it, such as, for conducting health-care interventions, tracking infections, or adapting education programmes to emergency situations.

However, the usage of AI systems also raises several problems, ranging from traditional usability issues to novel ones. For instance, Shneiderman reflected on issues concerning the balance between humans' control and AI's control, and advanced the Human-Centered Artificial Intelligence framework (2020). Similar and further concerns were also raised by the Vienna Manifesto (Werthner et al., 2019): "we must shape technologies in accordance with human values and needs, instead of allowing technologies to shape humans [...]" so as to "encourage human-centered innovation" in AI.

This contribution considers how to foster human centred AI in an AI & HCI syllabus. We believe it possible not only if computer science students acquire "knowledge from the humanities" (Werthner et al., 2019) but also from specific HCI and related areas which, historically, have borrowed and hybridised research methods from arts, humanities and social sciences.

**A proposal and related workshop questions.** What are the interaction paradigms/modalities/metaphors for AI systems that best support the interaction with users? What are design, development and user testing methods and practices currently adopted in AI? 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?

Nowadays, there are diverse such HCI methodologies or related approaches, which can help stir human-centred innovation in AI. The reason is that all of them can help students experience and create a continuous dialogue culture.

Examples are design thinking, co-design, and action research. Design-thinking techniques or methods are often employed to facilitate the ideation process and promote innovation. During the ideation, dialogues among design stakeholders are facilitated with a co-design approach, in which all are encouraged to engage in joint reflections on the technologies under design. Action research, instead, moves researchers/students into the field and aims at bringing benefits of the technology under development to all; an agreement among action participants is established to guide actions, define roles as well as to reflect on the results of actions with technology (Di Mascio et al., 2017; Gennari, Melonio, Rizvi, 2020).

Let us consider the example of the Maker Lab course at the Faculty of Computer Science of Free University of Bozen-Bolzano (UniBZ), now in its third edition, and let us see how it has benefited from co-design and design thinking.

This course aims at making students learn how to create prototypes of smart objects, through physical computing and ad-hoc web services. Participants in the course are, primarily, first-year Bachelors students from Computer Science. Other students have been exchange programme students from abroad universities and from the Faculty of Design & Arts of UniBZ. Recently it has also attracted students from the Faculty of Education of UniBZ.

In the first half of the course, all students learn about the basics of programming and programmable micro-electronics for physical computing, according to their skills. Teachers prepare the necessary scaffolding material and challenge students to learn by tackling different progressive micro-problems, in small groups or individually. Teachers' feedback is primarily formative and, whenever feasible, in-presence.

In the second-half of the course, students are challenged to listen to voices of 'real users' (e.g., of children and their design ideas) or real-world problems (e.g., related to public spaces in Bolzano), so as to ideate and prototype smart object solutions for them. The aforementioned HCI areas come into play, primarily, at this point.

Specifically, the course used methods from design thinking and co-design, to enable students, with different sorts of background, ideate with personas or scenarios. It has also offered students material and scaffolding examples which facilitate their rapid prototyping of ideas, such as pre-assembled physical computing kits and easy-to-use APIs for AI-based web services.

Interactions on evolving prototypes have been scaffolded also with typical design thinking or co-design material, such as reflection/evaluation cards.

These cards were used to challenge students' ideas from different viewpoints and in relation to the technology under evolution.

Across three years of Maker Lab, we have noticed how dialogues around technology under evolution do not tend to emerge "spontaneously" among different students. However, the choice of HCI methodologies, techniques and tools, as above, have had an impact on whether students succeed in co-creating and jointly reflecting on technological choices.

We also do believe in the need of bringing similar dialogue opportunities within society at large; we have conducted several workshops and summer camps, involving schools, children and their parents for ideating and prototyping smart solutions for their own contexts, and jointly reflecting on them.

The ultimate goal of all our efforts, aimed at university students or society at large, is to foster reflective habits when adopting, creating or evolving technologies, through dialogues--oi dialogoi.

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