AI as a Citizen: Eliciting Smart City Future Stories through Human-AI Collaborative Fiction Writing

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ABSTRACT

Smart cities are becoming an inevitable trend in the design of urban futures. With the speed of technological advancement, by the time that smart city visions come to life, the urban environment could already be seen as a co-living space of humans and technological entities, such as Artificial Intelligence. This raises the question of whether these future visions should get already co-created by both people *and* technology, especially given AI's potential role as a decision-making agent in data-driven smart city visions (e.g. urban planning). In this workshop, we aim to explore how visions of smart city futures can be co-speculated by people and AI through the collaborative process of writing fiction. Through writing short speculative stories, we want to encourage participants to critically reflect on their own expectations about smart city futures, as well as on what values these should preferably be based on. Moreover, we will analyze and discuss the future narratives and potential biases that AI might bring into the process of futuring.

CCS CONCEPTS

• **Applied computing** → **Computers in other domains**; • **Human-centered computing**;

KEYWORDS

Smart City, Values, AI Futuring, Human-AI Collaboration, Design Fiction, Speculative Design, Story Completion, Irritation

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1 INTRODUCTION AND RELATED WORK

Smart cities are future visions and a big part of the foreseeable future of urbanization. They gradually gain more attention, and different aspects are already intensely discussed in academia [20, 26, 27, 35, 43, 44, 47, 59]. These visions are heavily based on the promise of employing technology for the good of citizens, with an emphasis on using data for decision-making [15]. Where nowadays a person is behind pressing the button, in these future narratives technology would take over the responsibility for this based on data, this giving technology the same or more degree of agency than to citizens [8, 9]. The smartization of the world already comes with challenges, which mainly concern the creation of urban futures that ensure sustainability, diversity, inclusion and participation, especially if one considers that smart cities are future visions and still mostly a fantasy [10]. The act of designing and speculating implies the construction of bias, power and privilege [34, 50]. Having technology as an actor responsible for making decisions renders control over the values embedded in urban futures even more challenging, considering the biases already embedded in technologies such as Artificial Intelligence [11, 17, 18, 38, 46, 48, 58].

To create a space for reflection as well as a more positive outlook within the context of smart cities, futuring practices play a core role in envisioning and planning future scenarios, as shown by relevant related research [1, 32, 33, 45]. Overall, futuring practices involve the exploration of potential scenarios informed by current trends, technological advancements, and societal shifts [14, 41]. By engaging with speculative futures, stakeholders can anticipate

challenges, identify opportunities, and shape strategies to steer cities toward preferable outcomes and open the space for bottom-up future design and active citizen involvement.

1.1 Design Fiction for Exploring Futures

Critical and speculative design practices offer a methodological framework for imagining, negotiating, and critically engaging with societal values, future designs and possible future scenarios through the means of design [2]. Such practices have been already used to envision various positive and negative scenarios for urban development [24, 52, 53]. Design Fiction, a widespread practice in speculative and critical design, but also in design and HCI research, includes world-building, character creation, the design of fictional objects, speculation and storytelling with different media [3]. Design Fiction allows for the creation of depictions of future scenarios shaped by technological advancements, which can include perspectives of neglected or marginalised groups and non-human entities (e.g., other species, social agent technologies, AI). It depicts alternative future scenarios built on different perspectives and worldviews (e.g. through "ustopias" [40]), along with outlining broader contexts affected by future designs and technologies. While Design Fiction explores narratives of possible futures, its main goal is to stimulate reflection on the present, encouraging understanding, action, and shifts in perspectives [5]. Blythe [6] has used the term "research through design fiction" as a practice-based research approach: research in which insights and knowledge are gained through the process of producing fictional design concepts. While design fiction [22] was initially used by designers as a practice for exploring, questioning and investigating future scenarios through artifacts and stories, it has evolved in recent years as a method for participatory settings [31]. In co-design workshops, non-experts and participants of a given target group, including vulnerable groups [30, 37], are enabled to create fictional design concepts. This encourages engagement and discussion [57], as it allows participants to reveal their personal views in the form of suggestions, expectations, or rejections.

1.2 Storytelling as a Method for Participation and Generative AI

Storytelling plays a key role here as a means of encouraging reflection through the elaboration of stories [7]. Stories are a promising means to engage with futures and to build and reflect on imaginary worlds [4, 51], as well as to create alternative narratives [19, 29]. Having stories written by different individuals with diverse worldviews (in particular non-experts) offers an opportunity to gather diverse expectations, needs, requirements, wishes, or even fears. Stories can convey complex ideas and visions; they break down the complexity of scenarios into easily comprehensible everyday situations and make possibilities tangible [55, 56]. At the same time, writing stories requires the storytellers to think beyond individual aspects and look into cause-effect relationships. Changing the viewpoint and adopting the perspective of story characters makes it possible to look beyond one's own life and worldview.

However, writing fiction is also a relatively uncommon skill, which calls for the use of special methods, novel approaches or writing assistants. So-called "story completion" methods [12, 13, 49], where participants are encouraged to continue a story stem, place a rough topic in a specific storyline (e.g. life as an elderly person in a future smart city) and reduce the inhibition threshold of writing and thus of reflection. In this context, we consider generative AI to provide an opportunity for lowering the threshold for speculation and supporting of reflection and engagement in a playful and accessible way. This creates a potential for participatory settings with diverse stakeholders as a key strategy for encouraging citizen participation and eliciting diverse future narratives. The intersection between generative AI, design research and HCI is still a new and growing field of research, especially in relation to futuring. Related projects have already investigated stories as a medium for reflecting on future technologies by writing speculative fictions using language models [21, 28]. Others use "conversational storytelling" to help people reflect on and express their perspectives on certain topics through dialogue with a "storybuilding bot" [23]. An important feature of generative AI is that it offers serendipity and surprise, generating creative friction through unforeseeable outcomes [25]. Large language models (LLMs) can offer an appropriate degree of strangeness and irritation — including through incomplete associations, errors or misunderstandings [39]. These outcomes have the potential for irritations and thought-provoking impulses that may foster imagination.

2 FACILITATING SPECULATION AND CRITICAL REFLECTION THROUGH CO-WRITING FICTION WITH AI

AI will be an established citizen in future smart cities. Our approach embraces this by not only envisioning AI as a key stakeholder in our future urban lives but also acknowledging it as an active co-creator of future narratives. We argue that AI as an irritator and provider of thought-provoking impulses can facilitate speculation and critical reflection, and through this, help individuals to renegotiate notions of meaning and value that help them reshape the visions of the smart city.

In the workshop, we will use the *Futuring Machine*,[1], an assistant for Human-AI collaborative fiction writing. It is a prototypical web-based text editor powered by open-source LLMs (e.g. Mistral, Mixtral or LLaMa 3). The *Futuring Machine* offers a framework of interaction modes for engaging with the AI that are specially tailored to facilitate critical engagement with speculative futures throughout the process of writing [54](Figure 1). The AI prompts the user with story stems, incomplete sentences and cloze texts ("story completion" [13]) to elicit their vision of possible futures, related wishes or fears [12, 49]. The assistant follows the paradigm of iterative writing-completing, in which users and the interface take turns in an instruction-based conversation to further develop the text and push the story forward. In this way, thought-provoking impulses by the AI are directly embedded as part of the story narrative to reduce the user's inhibition threshold for writing and support them in critical reflection.

Nevertheless, AI can be strongly biased [11, 17, 18, 38, 46, 48, 58]. Such biases are particularly prominent in text generation [16, 36], which means that engaging with futures through AI comes with dangers. Human biases, inherent in both individual perspectives

[1]URL: https://github.com/jorditost/futuring-machines

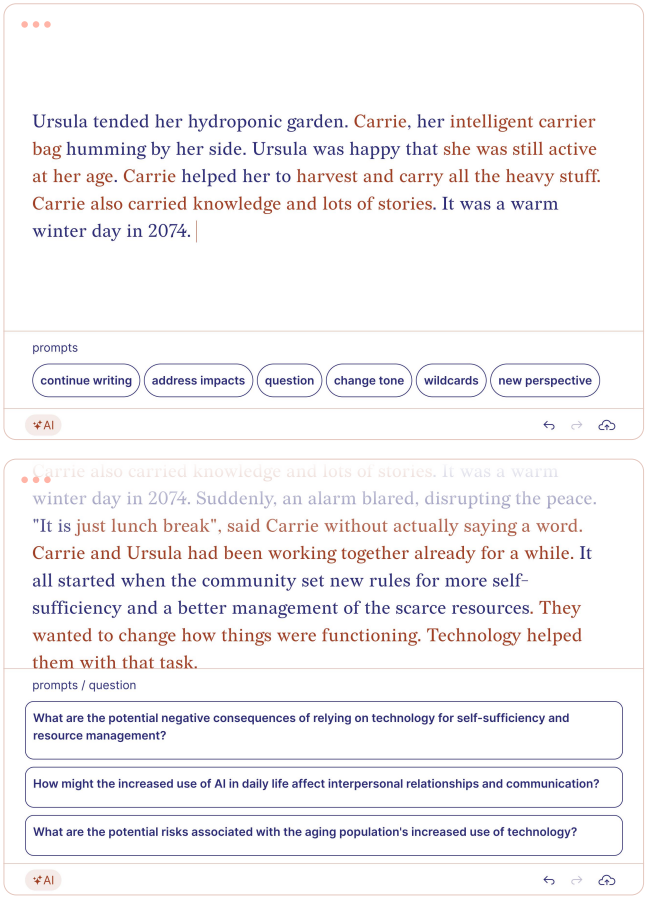

Figure 1: The *Futuring Machine* [54]. (a, top) Interaction modes for continuing the story; and (b, bottom) Critical questions generated as part of the mode "question".

and societal structures, can shape the narratives and scenarios produced through human-led speculation. Similarly, AI biases, stemming from the data sources and algorithms powering AI systems, can perpetuate inequities and reinforce existing biases in speculative outcomes. Widespread institutionalized future visions and narratives are therefore also embedded in AI systems.

In this context, we acknowledge that we risk reproducing bias in the stories and that this issue is especially relevant when the aim is to critically reflect on future imaginaries and elicit alternative, diverse future narratives. We address this challenge in which we take AI as an *irritating* partner throughout the writing process: we embrace AI in its role of providing thought-provoking impulses while encouraging the active role of the authors in shaping the narrative. With this mindset, bias in generated texts should not be taken for granted but rather as an opportunity to identify, acknowledge and critically reflect on stereotypical worldviews and related societal issues for then counteracting them in the stories. Creating a discursive setting to reflect on these issues will be a central aspect in our workshop format.

The potential of storytelling-led, AI-mediated speculation highlights the importance of citizen involvement in designing future cities. With AI acting both as a participant and as an assistant in gathering citizens' perspectives, it is timely to explore how the collaboration between people and AI can influence the future design of cities.

3 THE WORKSHOP

In this workshop, we want to delve into futuring and speculation, exploring the combination of human and AI perspectives through Human-AI collaborative fiction writing. Our primary objective is to gain insights into how AI can contribute to envisioning future scenarios for smart cities, by both supporting individuals in their writing process as well as, in the best case, creating a space for critically reflecting on widespread perspectives, values or worldviews.

We outline three key objectives:

(1) Explore values for smart city futures that participants would like to be at the core of speculations
(2) Explore the variety of positive irritations, conflicts and dissonances that facilitate speculation and critical reflection throughout the Human-AI co-writing process.
(3) Reflect on the outcomes and success of embedding values and biases brought by people and by AI.

Through AI-assisted futuring, as well as through human speculations, we aim to collect valuable data and analyze the outcomes in order to understand the visions and imaginaries crafted by individuals and those generated by AI, as well as their dissonances. By identifying starting points, nuances, and irritations in these collaborative speculation processes, we aim to shed light on the potential of AI in shaping futures of smart cities, in a way that it makes speculation and critical reflection on future scenarios accessible to a wider circle of people. We will further investigate points where human and AI-driven futuring clash or match.

Workshop mode. We plan to run our workshop in a hybrid format allowing both on-site and remote participants to join. We expect up to 14 participants in person (who can be either conference attendees or external visitors) and up to 10 participants joining online. Through the whole duration of the workshop will have a space for cross-medium discussion by using the online conferencing tool. Throughout the collaborative exercises, the online participants will collaborate with other online participants and the participants on site will form groups with other participants on site. Both will only need a computer with a modern browser, a webcam and microphone for taking part in the workshop. No programming skills or expertise in creative writing are required.

Workshop activities. Workshop activities will include a brief introduction, followed by a brainstorming session about values and perspectives future cities are or could be designed. Participants will be asked to collect and cluster values, as well as to generate ideas with the help of the 3-12-3 brainstorming method. Following, in a voting session participants will choose potential values or value groups, which they will use as the basis for their stories.

After that, the first writing session "Setting up the story — *without* AI" will follow. Participants will be asked to develop in groups the main character or characters of their story as well as draft the

setting or scenario where the story takes place. Building on them, participants will be engaged to write the beginning of their story. To facilitate these tasks we will provide participants with templates and prompts. We will also help them refine their ideas, and give them time to discuss details about their character and the fictional place they have created.

After lunch, the AI tool will be introduced to the participants, allowing everyone to try it out before the writing session begins. This will be followed by the second writing session "Developing the story — *with* AI as a co-author", in which groups will further develop their stories in close collaboration with the *Futuring Machine* [54]. Next, the stories will be presented. Last, a discussion concerning a critical reflection on the prompted stories, elicited futures, as well as possible bias or value conflicts embedded in the stories, will take place at the end of the workshop. Additionally, we would encourage a reflection on the collaborative writing process with the AI-powered assistant, including positive aspects, concerns, and a future outlook.

Table 1: Time (EEST) and activity schedule for the conference workshop.

Workshop activity	Time frame
Welcome and introduction	10:00 - 10:30
Values brainstorming and voting	10:30 - 11:00
Coffee break	11:00 - 11:15
Writing Session 1. Setting up the story — *without AI*	11:15 - 12:00
Lunch (+story development)	12:00 - 13:30
AI tool introduction	13:30 - 14:00
Writing Session 2. Developing the story — *with AI as a co-author*	14:00 - 15:00
Coffee break	15:00 - 15:15
Presentations	15:15 - 16:30
Discussion and outlook	16:30 - 17:30

Inclusion and accessibility note. We are open for assisting participants with special needs and encourage all in the need of such to contact us prior to the workshop. All activities are designed with a potential to adapt them towards the requirements of participants.

Next steps. We aim at using the workshop results for further analysis and publication with participant's consent. We would also like to invite participants to stay in contact for further collaborations by joining our community of researchers and practitioners interested in *smart city futures*,[2], as well as Human-AI collaborations, a part of which this workshop is.

4 CALL FOR PARTICIPATION

In this exploratory and creative workshop we will engage constructively with the concept of smart cities from a more-than-human perspective. We deliberately encourage participants with a wide variety of interests to take part in this workshop. Topics can include inclusion and exclusion, sustainability, feminist design, critical design, writing and storytelling in their relation to the design of smart cities. Within the workshop activities participants will examine their expectations and values regarding the future of smart cities. We will engage with these topics and expectations through the process of co-writing short speculative stories with AI. Through this process we will evaluate and discuss potential stereotypical visions, assumptions and biases that artificial intelligence might introduce into the narratives, as well as reflect on the challenges and opportunities of collaborating with AI, both as an active agent in creative processes and as a future citizen.

To register your interest, please send a short statement of interest to the first author in which you outline why you are interested in the workshop, how it relates to your work and what you would hope to get out of the workshop. We would additionally appreciate information about your background on cities and countries you lived in and are open to share your experience. This will help to ensure a diversity of perspectives on city life brought to the discussion during the workshop. Please further indicate your affiliation and whether you plan to attend the workshop in person or online.

For more details, please check https://urban-future-now.pubpub.org/mindtrek-24. For any questions, please contact konstantina.marra@uni-weimar.de.

5 ORGANISERS

Margarita Osipova is a PhD student and a Teaching Assistant at the Human-Computer Interaction Group, Bauhaus-Universität Weimar. She is a core researcher in the interdisciplinary project "Feminist Smart City" and focusing in her work on Feminist HCI in research methods for designing urban futures.

Jordi Tost is a design researcher and PhD candidate at Bauhaus-Universität Weimar. His work explores fictional, discursive, and non-deterministic methods and practices at the intersection of design research, HCI, and critical design practice. In his current research, he investigates the potential of generative AI as an irritating counterpart in human-AI collaborations.

Oğuz 'Oz' Buruk is an Assistant Professor of Gameful Experience at Tampere University, Finland. His research focuses on designing gameful environments for various contexts such as body-integrated technologies, computational fashion, posthumanism, urban spaces, extended reality and nature. He frequently employs methods such as speculative design, design fiction and participatory design.

Konstantina Marra is a Master's student at the Human-Computer Interaction department of the Bauhaus-Universität Weimar. She is working as a student assistant for the "Feminist Smart City" project. As her thesis work, she is designing an interactive stand for public spaces exhibiting wildlife, aiming to bring citizens closer to nature.

Britta F. Schulte is a post-doctoral researcher. His work explores our relationships towards technologies for elderly care and the ageing body, with a strong focus on intimacy and sexuality. In his works, he often uses speculative and creative approaches such as storytelling and design fiction in many forms.

Jeffrey Bardzell is Professor of Information Sciences and Technology at the Penn State University College of Information Sciences and Technology. With a background in literature, he brings a

[2]Community webpage: https://urban-future-now.pubpub.org

critical and humanities-oriented perspective to human-computer interaction, design, and information science. His research focuses on creativity, criticality and design thinking; aesthetic interaction and experience design; social informatics and participatory design; and AI and more-than-human design.

Eva Hornecker is a Professor of HCI at Bauhaus-Universität Weimar. Her work connects technology, design and a social science angle, with a focus on non-screen interfaces/devices and interactions, and on collaborative and situated action. Some of her prior research relates to Media Architecture and Urban HCI. She has a strong interest in exploring qualitative, participatory, and creative research methods.

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