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# Urban AI: Formulating an Agenda for the Interdisciplinary Research of Artificial Intelligence in Cities

**Aale Luusua**

University of Oulu  
Oulu, Finland  
aale.luusua@oulu.fi

**Johanna Ylipulli**

Aalto University  
Espoo, Finland  
johanna.ylipulli@aalto.fi

**Abstract**

This workshop forms a novel research community around the topic of 'urban AI'. Within it, we will scrutinise the intersections of *artificial intelligence(s)* and *cities* – i.e. urban life, spaces, places, geographies, infrastructures, and practices – from a multidisciplinary, design-oriented perspective. There is a need to form this community, as AIs are being infused as parts of cities at an increasing pace. Thus far research on AIs have been somewhat split into two differing approaches; one that is focused on the grassroots, practice-based engineering of novel AI applications; and another that assumes a large-scale, future-oriented and philosophical approach. We suggest that a third perspective, informed by disciplines that build bridges between high level concepts and empirical realities, is necessary to straddle these two. Traditionally, this has been the realm of design; In this workshop, we ask what themes, questions and methods should be addressed by an emerging design-oriented urban AI research community?

**Author Keywords**

Artificial intelligence; cities; interdisciplinary; design research.

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## ACM Classification Keywords

Computing methodologies~Artificial intelligence

## Introduction

The aim of this workshop is to form a novel research community around the topic of “urban AI”. Within this topic, we will scrutinize the intersections of Artificial Intelligence(s) and cities – i.e. urban life, spaces, places, geographies, infrastructures, and practices – from a multidisciplinary, design-oriented perspective. There is an urgent need to form this research community, as AIs are being integrated into cities and as parts of urban lives, and being further developed at an increasing pace. In simple terms, AI can be described as technology which attempts to mimic human intelligence, and according to some, possibly surpass it [2, 3, 4, 10]. Another way of looking at AI might be to consider it as a set of algorithms that are capable of autonomous adaptation and decision-making. Thus, urban AIs, as we choose to call them, in their various forms constitute novel non-human agents that affect human lives in cities.

The twin phenomena of urbanization and digitalization mean that many AIs have the ability to infuse themselves into the everyday lives of more and more people. Applications of “urban AIs” include not only infrastructural computing, such as facial recognition systems, but also commercial end-user applications, such as personal assistant applications, (semi)autonomous vehicles, and everyday homes in the form of smart speakers and home assistant systems. Thus, AIs have the ability to touch on every aspect of urban experience. Travel practices, for instance, are also very much informed by AIs through various recommendation and optimization algorithms that

subtly but deeply affect the routes we now often take via car, air, rail or by foot or bicycle.

AIs can now reasonably be said to orchestrate [1] urban lives to an increasing extent. Utilising the terminology of Ray Oldenburg [11], we can see that AIs have permeated first places, second places and third places; i.e., homes, workplaces, and public urban places, respectively. As previously discussed, travel spaces are also heavily influenced by them, adding a fourth place to this list. AI, then, has changed the way urban inhabitants live their lives in cities (and moving between them), and the way in which they experience urban spaces and places. The development of AIs is also giving rise to novel ethical issues [7, 8, 10]. As AI applications are developed further, these become entangled with questions of city-making ethics: who has the right to plan, design and live in cities [6]. As urbanization and technologization propel each other forward, these phenomena become deeply intertwined. Whatever happens with AI’s, also has a profound effect on cities and urban life. What will occur when we will increasingly share our cities with non-human, technological entities that are capable of making decisions on our behalf?

However, thus far, the research on AIs have been somewhat split into opposing approaches: what we might call “the engineering approach to AI” [e.g. 5, 12] and “the philosophical approach to AI” [e.g. 2, 3, 4]. These approaches are necessary; however, we suggest that a *third* perspective is necessary to bridge these two: one that is interdisciplinary and designerly at the same time. In design, one of the central questions is, in what manner and with what means should technologies be applied to human lives? It attempts to both gain

benefit from engineering insights, applying them in a human-centred way; it also attempts to imagine new worlds and new ways to live in the material and social world. These viewpoints will be absolutely necessary in the design of urban AIs. Yet, the world of design is not without its biases and blind spots; recently, the fervently human-centred approach of design has been called into question. Indeed, the global devastation of various species and the rapid change in climate patterns is a striking reminder that humans and their technology can wield a terrible power over non-humans. AIs bring a productive viewpoint into these discussions as well; it invites, or perhaps, forces us, for the first time to seriously consider whether there will one day be non-human agents who wield similar power over us. [9]

The study of urban AI, must in the future, strive to take into account as many of the aspects, stakeholders and technologies that are present in cities. Thus, our workshop is intended for researchers, designers, educators and industry experts from various fields from design, the social sciences and technology. These fields and subfields may include, but are not restricted to: Anthropology, Architecture, Computer Science, Design, Geography, Information Systems, Interaction Design, Machine Learning, Participatory Design, Robotics, Service Design, Social Sciences, and Urban Design and Planning. Within this workshop, we help our participants from these diverse backgrounds to identify and leverage the strengths of their personal expertise, as well as that of their disciplines. It is important to recognize that various disciplines have differing views on what constitutes a meaningful research question; what sorts of methods should be used to answer them; how data or materials should be analysed; and even,

what is a worthwhile result. Due to our backgrounds in interdisciplinary research, we have experienced both the difficulty and fruitfulness of coming together from various backgrounds to study the phenomena around novel technologies. We will use our perspectives to foster conversations and work between workshop participants.

We will directly address topics that include, but are not limited to, the use of various methods and approaches, such as speculative design, design artefacts and fictions, research through design, critical design, cultural analysis and participatory design. Perspectives on urban places, spaces, people, communities, identities and diversity; democracy, materiality as well as AIs and other non-humans as actors. Likewise, the major themes of sustainability, and health and wellbeing are addressed. Some meaningful contributions to this workshop may include for example:

- Theoretical considerations, for example, how can we utilise key theoretical concepts from various fields to analyse urban AI's and inform their design
- Case studies of AI in urban settings; empirical works that explore the way AI's affect cities and urban lives;
- Design-based explorations of urban AI implementations in real-world settings
- Methods, including the challenges and opportunities urban AI's will present to methodologies such as participatory design, citizen science, ethnography, research through design, etc.

- Thematic issues such as limitations, biases, shortcomings and ethical dilemmas of AI; aesthetics of AI and urban environments; data privacy and surveillance in cities; identifying use cases and users of urban AIs; consequences of AI's on urban life and/or infrastructures; what geographies of AI are emerging?; design thinking and AI

Overall, we attempt to answer the question: what themes and methods should be addressed by an urban AI research community? How could we formulate relevant, thoughtful, critical, participatory and democratic approaches to researching and developing urban AIs? How can the DIS design and research community help shape the future of AI's to be as sustainable and democratic as possible?

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