ACADEMY
of SOCIAL
SCIENCES

Overview

Artificial Intelligence (AI) presents global societal challenges for researchers and policymakers. Machines have long been shown to be beneficial where their actions can be expected to achieve the objectives sought by human beings and not by machines with minds of their own. The goal for AI research is to create a system that requires no problem-specific engineering but can be assigned to carry out tasks such as teaching a molecular biology class or running a government.

Given the highly complex, multi-stakeholder dialogue and decision-making processes involved, the application of AI in the context of urban planning is of particular interest for researchers from a wide range of hybrid disciplines spanning physical and human geography, political economy, public administration, socio-legal studies, social policy and anthropology. The territory of cities is the stage where developments leave their physical footprint. Properly planned urban development requires an integrative and participatory decision-making process that addresses competing interests and is linked to a shared vision, an overall development strategy and national, regional and local urban policies. In practice, this is a continuous and iterative process, facilitating and articulating political decisions based on different scenarios and translating those decisions into actions that will transform the physical and social space and support the development of integrated cities and territories.

Throughout the urban planning process, each of the many persons and institutions affected by a plan may pursue their own interests, their priorities may shift, new issues and policies may emerge, and actors may join constellations with specific motivations, interests and capabilities. Nobody in the process is likely to have full information, and no single person is 100 per cent rational in his or her perceptions and actions. Very little knowledge is certain, especially regarding the future. These limitations make planning a complex enterprise. They explain why its processes often generate suboptimal results, why constant reviewing of plans is necessary, and why the authors of the International Guidelines on Urban and territorial Planning IGUTP understand urban and territorial planning ultimately as a continuous and iterative decision-making process. The hope is now that AI tools can help to develop and implement better urban plans and ultimately increase the quality of life in cities. But urban planners also ask: should AI be seen just a technical tool, a digital twin, or could AI even become a controlling factor co-piloting city planning?

Key evidence

Currently, no general-purpose AI urban planning programme exists that does everything. Instead, developers are building and experimenting with different types of agent programmes designed to address different types of problems. Three scenarios can be identified to describe the positioning of AI in future urban planning:

1) **Urban planning by AI increases control over life in cities**: In the worst-case scenario, AI will be programmed to ignore the objectives and preferences of citizens. By targeting the lowest common denominator, it may instead lead to lower standards of quality of life and levels of urban sustainability, while surveillance and control might be added to the objectives of AI applications as major planning objectives, threatening to reduce or destroy freedoms of citizens.

2) **AI serves as a technical tool and assistant for planners**: This second configuration is often presented as the preferred scenario. Here, AI is strictly limited to functioning as a technical tool without power over humans, with AI applications filling data gaps and writing intelligent concept papers that generate problem trees and shorten the time needed to generate ideas. AI applications are given access to all applicable national and local visions, policies, laws, rules and regulations, including building codes, design guidelines, the United Nations' Sustainable

Development Goals, the objectives of stakeholders and budgetary information, as well as best practice cases from other cities. Based on this cumulative body of knowledge, AI applications can, and increasingly often already do, generate design proposals, and textual descriptions of plans. They may even suggest how to reconcile competing interests, making it difficult to tell whether they are created by a human being or by AI.

3) **AI serves as a digital twin providing planners with alternative options**: Machines may be far more capable than humans but are likely to remain far from perfect. AI as a digital twin can support planning departments to keep processes on track. However, if humans put the wrong objectives into a machine that is able to learn and is more intelligent than they are, it will achieve the objective regardless of any unwanted and unintended consequences. As planners get used to data and recommendations from AI, it can gradually gain influence over humans and become a co-pilot or at least a digital twin in planning rather than being treated as a tool.

Policy contexts

In urban planning, the process takes years from the development of operational plans through to their implementation and evaluation. We are only beginning to understand generative AI's capabilities and risks; the long-term impact on AI on the entire process remains to be seen. But our three scenarios have already been adopted by urban planners in advanced societies across three categories: **sceptics** who are cautious and largely opposed to the development of new technologies; **optimists** who are convinced that AI will be beneficial if used exclusively as technical tools unable to gain control over humans; and **realists** who are interested in the benefits of AI but who are also aware of the risks.

The success or otherwise of the introduction of new technologies is found to be dependent on a mix of contextual factors. Not every city has the best equipped planning department or the technical resources for sound planning. This situation often arises in fast-urbanising countries in the Global South, in cities with high numbers of foreign refugees or internally displaced persons. In addition, the degree of authority for urban planning delegated to cities varies a lot between countries and even where provision for AI exists, political decision-makers may use them as a political tool by including biases or discriminatory patterns in their outcomes.

Recommendations

AI researchers are predicting that AI will progressively penetrate all spheres of life. Research into the most effective use and the impacts of AI in the urban planning process remains at an early stage, and no final conclusions are available. To prepare for the challenges and risks associated with AI:

- Social scientists, politicians and the general public must be prepared to anticipate and adapt to the impact of AI on whole societies and political systems.
- Planners need to explore risks and opportunities of AI applications as technical tools, and as co-pilots that are capable of gaining influence over perceptions and actions of humans, or of becoming a dominant tool for the control of cities and citizens' lives.
- Citizens need to be given insights into planning and decision-making processes beginning with the way objectives and preferences are programmed into machines.
- Given the magnitude, complexity and interrelatedness of the challenges facing society, researchers must prevent a new culture war with Luddites wrecking learning machines.
- Instead, scientists and policymakers across the world should learn how to use wisely-governed AI to increase the much-needed problem-solving capacity of cities and beyond.