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The Urban Ethics of an AI-powered Planetary Urbanization

Summary

By 2100, the world may be entirely urbanized with every person living in cities. This imminent reality of planetary urbanization is likely to entail drastic environmental, economic, and social changes, all of which in turn are likely to impact the nature of human relations and their interactions in cities. Urban ethics is, therefore, concerned with the question of what ought to be the proper relations between people flourishing in the city? This question is presently compounded by the rise of the 'smarter smart cities', where urban technologies are enabled by artificial intelligence (AI) that can sense, track, learn, predict, and attempt to control human behaviors. The rapid confluence of these three developments, namely, planetary urbanization, urban ethics, and the AI-powered smart city, reveals an under-explored scenario pregnant with new social promises yet laced with many moral hazards. In this article, the following scenario, which is bounded by the following three vectors, will be examined: (i) How does the urban shape the ethical, and in what ways? (ii) What is the AI-powered smart city, and how does it impact the present notion of planetary urbanization? (iii) How does the AI-powered smart city change ethical agencies and in which specific ways? Together, the answers to these questions begin to further prime discussions in urban bioethics in the milieu of AI-powered cities.

Keywords: planetary urbanization, urban ethics, artificial intelligence, smart city, ethical algorithms.

Introduction: From cities to planetary urbanization

By the middle of the 21st century, some six billion people will be living in cities.¹ One specific study projects that by the year 2100, the world will almost be entirely

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1 OECD (2015). *The metropolitan century: Understanding urbanization and its consequences*, Paris; OECD Publishing, 11.

urbanized with every person living in cities.² Much of this urbanization is also uneven and will be concentrated in the so-called global south.³ All these projections, therefore, mean that the descriptor ‘city’ will become increasingly anachronistic.⁴ If everyone will be living in the city, then what is a city?

A city has been conventionally defined as a principally nodal, relatively large, densely populated, and self-enclosed socio-spatial entity.⁵ But these definitions are now being challenged by extensive sprawls, urban agglomerations, and informal settlements that together defy both the physical and conceptual limits of the conventional city in what is increasingly referred to as planetary urbanization.⁶ Planetary urbanization also presupposes a planet-wide technosphere—the set of large-scale networked technologies that undergird and enable rapid extraction and production of energy, long-distance communication and mobility, and high-intensity industrial and agricultural productions that in sum, makes civilized survival possible for a global population of nearly seven billion.⁷ Some partial failure in the technosphere of industrial agriculture, for instance, would spell disaster for humanity.⁸ Increasingly, this technosphere is also becoming autonomous. The power grid, for example, operates on its own with little human intervention,⁹ and quite commonly these days, one may be talking to a remote chatbot that one can neither disagree with nor protest to.¹⁰ Along this line, an emerging area of the technosphere are smart urban technologies—defined as technologies that are capable of taking cues from their environment, and based on these inputs, proceed to solve problems, assess risks, make predictions, and take actions autonomously.¹¹

2 Batty, Michael (2018). *Inventing future cities*, Cambridge; MIT Press, 26.

3 Parnell, Susan; Elmqvist, Thomas; McPhearson, Timon; Nagendra, Harini and Sorlin, Sverker, (2018), Introduction: Situating knowledge and action for an urban planet, in: Elmqvist, Thomas; Bai, Xuemei; Frantzeskaki, Niki; Griffith, Corrie; Maddox, David; McPhearson, Timon; Parnell, Susan; Romeo-Lankao, Patricia; Simon, David and Watkins, Mark eds., *The Urban Planet: Knowledge towards sustainable cities*, Cambridge University Press; New York 2018, 1-16.

4 Batty, M. (2018), 14.

5 Brenner, Neil (2014), Introduction: Urban theory without an outside, in: Brenner, Neil ed., *Implosions/Explosions: Towards a study of planetary urbanization*, Jovis; Berlin 2014, 14-30.

6 Brenner, Neil and Schmid, Christian (2014), Planetary urbanization, in: Brenner, Neil ed., *Implosions/Explosions: Towards a study of planetary urbanization*, Jovis; Berlin 2014, 160-163.

7 Haff, Peter K. (2014), Technology as a geological phenomenon: Implications for human well-being, in: Waters, Colin N.; Zalasiewicz, Jan A.; Williams, Mark; Ellis, Michael A. and Snelling, Andrea H. eds., *A stratigraphic basis for the Anthropocene*. Geographical Society of London; London 2014, 301-309.

8 Ibid., p. 305.

9 Ibid., p. 306.

10 Jewell, Matthew (2018), Contesting the decision: Living in (and living with) the smart city. *International Review of Law, Computers & Technology*, 32(2-3), 210-229.

11 Shaw, Jonathan (2019), Artificial intelligence and Ethics. *Harvard Magazine*, January-February 2019, 44-74.

The technological city enabled by information communication technologies (ICTs) is not a new idea.¹² But an all-encompassing artificial intelligent (AI) technosphere—a “smart techno-social environment” that envelopes the urban life-world, embedded with networked sensors powered by algorithms that are constantly collecting, transmitting and learning from data,¹³ which eventually makes decisions autonomously or comes to know enough to ‘nudge’ the behaviors of people¹⁴—is new. In the AI-powered urban environment, prediction inadvertently turns into control, where the surest way to predict is to shape behavior.¹⁵ And all these are taking place just at the same time when a wider array of digital tools of analysis and data have emerged to understand cities.¹⁶

The rise of advanced AI-powered technologies within the same span of unprecedented planetary urbanization is, therefore, not a coincidence. These AI-powered technologies are advanced by data, and the contemporary urban environment is a massive factory of big data. The digitization of the urban environment is producing immense amounts of data from sensors embedded in various infrastructures, to governmental data and consumers’ transaction data, among others.¹⁷ In turn, these data sets are mined and analyzed—often autonomously by algorithms—for “actional insights” that can enhance the efficiency or effectiveness of business decisions, policy-making, and urban management.¹⁸ In these ways, the convergence of AI-powered technologies with an unprecedented phase of planetary urbanization will not only further empower these technologies (and the corporations that control them), but will also likely shape urbanization in uneven, and perhaps, other wholly unanticipated ways.

How then do AI-powered technologies impact human and non-human lives today, and in this process, also come to shape or transform the ethical agencies of individuals living in the urban environment? Urban studies have yet to offer clear answers to the impacts of AI-powered urban technologies. Conversely, AI discourses have yet to consider the city as a primary site of study even when cities produce massive

12 Mitchell, William J. (1999). *E-topia*. Cambridge; MIT Press.

13 Frischmann, Brett and Selinger, Evan (2018). *Re-engineering humanity*. New York; Cambridge University Press, 126-127.

14 Zuboff, Shoshana (2019). *The age of surveillance capitalism*. New York; PublicAffairs, 294.

15 Ibid., p. 201.

16 Shelton, Taylor (2017), The urban geographical imagination in the age of Big Data, *Big Data & Society*, January-June 2017, 1-14.

17 Pan, Yunhe; Tian, Yun; Liu, Xiaolong; Gu, Dedao and Hua, Gang (2016). Urban big data and the development of city intelligence. *Engineering*, 2, 171-178.

18 Mittelstadt, Brent D.; Allo, Patrick; Taddeo, Mariarosaria; Wachter, Sandra and Floridi, Luciano, (2016), The ethics of algorithms: Mapping the debate, *Big Data & Society*, July-December 2016, 1-21.

quantities of data required for machine learning, which are critical to advancing AI.¹⁹ But the most glaring omission, however, may well be the ethical: little is known about how the convergence of AI-powered urban technologies and planetary urbanization would impact an individual's ethical agencies within an urban environment that is 'intelligent', and perhaps in the near future, also limitedly sentient.

Ethics, morality, and ethical affordances in the city

Here, it is important to define ethics and morality in relation to the city.²⁰ While both terms refer to the sphere of values, a concise distinction suggests that ethics refers to the relations that we should have with other people, while morality, in contrast, is about how human relations should be in virtue of our nature as human beings.²¹ To further illustrate this distinction, morality demands that a person should treat others fairly, and with dignity and compassion. But in non-ideal circumstances, the moral demands of fairness, dignity, and compassion can conflict, and ethics will be required to decide on how to satisfy each of these moral demands adequately, which in turn defines the ethical relation between this individual and others. And because human relations can be shaped by the physical design of the built environment, and because this built environment can also come to reflect the collective values of the city, architectural and urban design, therefore, shapes ethics in the city in important ways.²² After all, the human being is a body of flesh and blood that is made each day by its living conditions, where hope, desire, expectation, and will—that is, people's well-being and capabilities—are shaped by material surroundings.²³

One important way is how architectural and urban design can shape ethical affordances. Such affordances, in turn, shape the ethical condition—they incline certain projects and actions but not others and invite individuals to turn in one direction or another.²⁴ For example, the renovated Reichstag in Berlin is designed with transparency in

19 Lim, Chiehyeon, Kim, Kwang-Jae and Maglio, Paul P. (2018), Smart cities with big data: Reference models, challenges, and considerations. *Cities*, 82, 86-99.

20 Tsoukala, Kyriaki, Terzoglou, Nikolaos-Ion and Pantelidou, Charikleia. (2015), Prologue: Rethinking space and ethos: critical intersections, in Tsoukala, Kyriaki, Terzoglou, Nikolaos-Ion and Pantelidou, Charikleia eds., *Intersections of space and ethos*, Routledge; New York, 2015, xx.

21 Margalit, Avishai (2010). *On compromise and rotten compromises*. Princeton; Princeton University Press, 2-3.

22 Taylor, William M. and Levine, Michael P. (2011). *Prospects for an ethics of architecture*. New York; Routledge, 174.

23 Nussbaum, Martha C. (2019). *The cosmopolitan tradition: A noble but flawed ideal*. Cambridge; Harvard University Press, 39.

24 Lambek, Michael (2015). *The ethical condition: Essays on action, person, and value*. Chicago; The University of Chicago Press, 3.

mind,²⁵ which inclines democratic behaviors and disincline undemocratic behaviors before public eyes. Ethical affordances also suggest potentiality: for instance, a public bench may invite one to sit and chat with a stranger, but it does not determine the decision to sit.²⁶ And the affordances of oppressive urban design often render ethical responses salient: whether it is an individual's decision to scale the walls of the Jewish ghetto, or the evicted residents' resistance against the developers' might. Ethical affordances invite new moral possibilities, but they also constrain ethical decision-making in definitive ways.

This recognition that the urban built environment is not just a habitat, but also a moderating variable comprising many ethical affordances that can constrain an individual's ethical horizon, is critical to what AI-powered planetary urbanization portends. If urbanization can shape people's well-being and capabilities, and if such capabilities can be further enhanced or constrained by AI-powered technologies, then the convergence of AI-powered technologies and planetary urbanization presents an unprecedented window to advance, or conversely to diminish the human condition in significant ways. If this projection is sound, then to further examine this convergence will require drawing from three different fields of study simultaneously—namely, urban studies, AI, and ethics. However, these three fields have yet to coalesce in any systematic way. For this reason, connecting these fields by pairing them first then constitutes the initial step that can triangulate the bounded but under-explored ethics of AI-powered planetary urbanization.

In view of this unexplored area, the rest of this article will attempt to address the following three broad questions—each representing an axis of one dyadic pairing that bounds this triangulated area. First, by connecting urban studies with ethics: How does the urban shape the ethical, and in what ways? Second, by connecting urban studies with AI: What is the AI-powered smart city and how does it impact the present notion of the planetary urbanization? And finally, by connecting AI and ethics: How does the AI-powered smart city change ethical agencies and in which specific ways? Together, these questions, and their working answers, bound the important knowledge area on the ethics of AI-powered planetary urbanization.

Transiting from Bodo Ethics to Urban Ethics

How does the urban shape the ethical, and in what ways? To answer these questions, the following arguments attempt to trace the changes in ethics between a medieval

25 Taylor, William M. and Levine, Michael P. (2011). 41.

26 Keane, Webb (2016). *Ethical life: Its natural and social history*. Princeton; Princeton University Press, 28.

village community and a modern city today. In other words, and broadly, how has the nature of ethics changed between *Gemeinschaft* (community) to *Gesellschaft* (civil society)?²⁷ How have ethical relations between people, who were bounded together in shared beliefs and practice of a medieval village, changed when they become autonomous, choose their own values and beliefs, and maintain loose ties with others despite physical proximity with other people, especially in modern cities?²⁸

As a start, let us consider Bodo, who was a real person—a 10th-century serf—of the abbey of St. Germain des Pres.²⁹ In the 10th century, the parish of St. Germain des Pres was outside the city walls of medieval Paris, and it is therefore quite appropriate to say that Bodo lived in a village, perhaps a community no larger than eighty persons—all of whom Bodo most likely knew or interacted on a daily basis.³⁰ Bodo lived a short life characterized by unceasingly hard labor; he was unfree, uneducated, and poor.³¹ And what Bodo and his family consumed was likely produced in the village, by individuals that Bodo likely knew by name. The only product that Bodo might have consumed from the outside of his village was a little salt that likely came by way of inter-regional trade from the Bay of Biscayne.³²

And in all likelihood, Bodo could not choose at will to do what he desired because he was obligated to perform his work as a serf.³³ Yet, Bodo was not specialized as a contemporary person would be in his or her professional work; the practice of division of labor was neither apparent nor common in Bodo's days. For this reason, Bodo would have to know how to do many things vital to his own survival, or else, he would have to call on his neighbors' help.³⁴ In this way, although Bodo's social network was very small in contrast to a contemporary person today, he could reliably depend on them for help—as he would help them if he was called upon—in times of need. And Bodo would have interacted with his small network of fellow villagers day in and day out, year to year, until the end of his life.³⁵ Therefore, it is possible to suggest that Bodo's community was characterized by reciprocity rather

27 Haidt, Jonathan and Kesebir, Selin (2010), *Morality*, in: Fiske, Susan T.; Gilbert, Daniel T. and Lindzey, Gardner eds., *Handbook of Social Psychology*, Hoboken; Wiley 2010, 797-832.

28 *Ibid.*, p. 800.

29 Leijonhufvud, Axel (1995), *The individual, the market and the industrial division of labor*, in: Mongardini, Carlo ed., *L'Individuo e il Mercato*, Rome; Bulzoni Editore 1995, 61-78.

30 Hardin, Russell (1999), *From Bodo ethics to distributive justice*. *Ethical Theory and Moral Practice*, 2, 399-413.

31 Leijonhufvud, A. (1995), 61.

32 *Ibid.*, p. 62.

33 *Ibid.*, p. 63.

34 *Ibid.*, p. 62.

35 *Ibid.*, p. 61.

than exchange, and where transactions between individuals were obligatory, rather than voluntary.³⁶

Bodo's embedded practice in the life of this medieval community offers a glimpse of his ethics. First, ethics must have been a compound of religious values and social reciprocity.³⁷ It is unclear if Bodo actually loved his neighbors; but nevertheless, the Golden Rule of, "Therefore all things whatsoever ye would that men should do to you, do ye even so to them..."³⁸, would have been surely familiar to Bodo. Bodo's life was lived in close scrutiny by everyone else—as he was able to scrutinize his neighbors—and the consequences of being unreliable, or untrustworthy, would swiftly be known to everyone. Failures of reliability became apparent, and those who were consistently unreliable turned into pariahs in due course.³⁹ In this way, the ethics of Bodo's medieval community revolves around a set of threatening constraints: do not fail to keep your promises—or else! And do not lie, cheat, or steal—or else!⁴⁰ Consequences for the defector of these norms were real, and they were readily enforceable by the community.⁴¹ It may be possible to suggest that Bodo's ethics was impelled by a simplistic morality of common sense,⁴² and perhaps at most, the morality of obligation and duty guided by simple axioms such as the Golden Rule. Ineluctably, the motivation for doing certain things here tends to appeal to reasons of the past—that one had promised, or that one had been helped.⁴³ The idea that one requires ethical knowledge to clarify and decide between different claims of rival and incompatible moralities,⁴⁴ would have been unfamiliar to Bodo. After all, Bodo was never required to attain the status of an independent, inner-directed and critically minded autonomous moral agent⁴⁵—for the community performed the act of moral self-regulation on his behalf.⁴⁶

It is not known if Bodo ever visited medieval Paris in his life, but he would have no doubt seen the city walls across the Seine and perhaps wondered at the distinctive differences of life behind a walled city and his village of St Germain des Pres. For Bodo, everyday life would have revolved around his work in the fields, or the activities

36 Ibid., p. 63.

37 Hardin, R. (1999), 402.

38 Matthew 7:12

39 Hardin, R. (1999), 402.

40 Ibid., p. 402.

41 Ibid., p. 402.

42 Ibid., p. 402.

43 Williams, Bernard (2006). *Ethics and the limits of philosophy*. London; Routledge, 8.

44 MacIntyre, Alasdair (1988). *Whose justice? Whose rationality?* Notre Dame; University of Notre Dame Press, 2.

45 Frankena, William K. (1973). *Ethics. Second Edition*. Upper Saddle River; Prentice Hall, 4.

46 Hardin, R. (1999), 402.

centered around the abbey of St Germain des Pres. The medieval abbey would have been imposing for Bodo and his fellow villagers, especially when contrasted to their domestic dwellings against the bucolic surroundings. This constant, physical proximity to one's neighbors, in relation to the locus of a religious structure, might have reinforced the norms of reciprocity and rendered palpable the cost of defecting behavior in this life and thereafter. Importantly, his village probably did not change much in Bodo's short life-span, and important choices required to adapt to major or novel transformation in his lived environment were probably far and few, if any.

In stark contrast to Bodo's lived environment, a cosmopolitan Parisian today—let us call her M—would have to interact with many more people in her daily life. M is likely to have neighbors. But she may not know her neighbors, as these neighbors are also likely to be indifferent to her. In contrast to Bodo, whose allegiance was to his small group of neighbors, M is likely to have a far more extensive circle of allegiance to, and responsibility for, different individuals, groups or entities—all moral strangers, or people whom M shares no ultimate convictions.⁴⁷ M's allegiances and responsibilities to these moral strangers are not only fluid and somewhat thin relative to Bodo's, but they also conflict often in irresolvable ways. For the sake of argument, M is an architect who has to maintain allegiance to her superiors and her clients, but who is at the same time, also a professional that bears a social responsibility for her society and the environment. M's ethical sensibility may be severely tested, if not utterly pushed to its limits, if she is now tasked to work on a greenfield smart city project that enhances surveillance but threatens the right to privacy, and irreversibly destroys a forest but indisputably also creates new jobs. What kind of ethics could M then call on for help? She is likely to find that traditional morality provides little if any, guidance on these quandaries.⁴⁸ In encountering this kind of dilemmas and more, M is likely to experience the gale of uncertainty common in the postmodern ethical experience, where there is neither a guarantee for moral conduct nor are there default rules and principles universally valid for all time and place.⁴⁹

And for M, the city of Paris is no longer bounded. Instead, it belongs to a vast metropolitan region that is, in turn, connected to other towns and major cities in France through a network of high-speed transportation system. M, traveling on a high-speed TGV, from Paris to Lyon, for instance, would have started and ended the journey in a completely urban environment with few moments passing by that would have counted as an uninhabited rural space. Effectively, there may not even

47 Engelhardt, H. Tristram (1986). *The foundations of bioethics*. Oxford; Oxford University Press, 411.

48 Gardner, Howard (2012), Reinventing Ethics, *New York Times*, <https://opinionator.blogs.nytimes.com/2012/09/23/reinventing-ethics/> (accessed: 26 December, 2019).

49 Bauman, Zygmunt (1993). *Postmodern Ethics*. Malden; Blackwell, 10-13.

be a beginning or an end in this urbanized fabric as Lyon is linked to other far-flung urban centers through high-speed mobility infrastructure by land and air. And suppose that M also travels regularly to international destinations, she is then likely to find herself enmeshed in various cultural and political identities foreign to her own. In this way, although she might be physically present in Paris, her political and moral experiences are nearly contiguous with others far away from her in France. She might, for instance, advocate for women's rights in India and support the human rights of the Rohingya refugees in Cox's Bazar, but maintain a mix of concern and anxiety for the social conflicts observed in France.

This hypothetical depiction of M is merely an ideal-type to exaggerate the contrast to Bodo's life. M's urban experiences of an affluent cosmopolitan living in central Paris are hardly representative of the more difficult life of a resident living in the *banlieues* of Paris or an informal settlement elsewhere in the urban world. And importantly, Paris belongs to a vast metropolitan region that accommodates a multitude of different neighborhoods and enclaves—many that remain entrenched in the ways of *Gemeinschaft* rather than *Gesellschaft*.⁵⁰ But caveats aside, and for the sake of continuing this argument, let us further suppose that M lives daily in the constant and proximate company of strangers in central Paris. This urban environment would then confound M's moral faculty: While human morality has evolved to pay close attention to those nearby, who at least in evolutionary history, were close relatives or kin,⁵¹ these nearby neighbors in contemporary cities are now mostly transient strangers that tend not to trigger the same empathetic response reserved for close kin. M may, in time, attain the cosmopolitan empathy to treat her foreign neighbors like her kin, but this empathy has to be repeatedly learned and reinforced, and it has first to presume willingness to bridge deep differences.⁵² For Ignatieff, this willingness is made more possible by the presence of "ordinary virtues", namely, trust, honesty, politeness, forbearance, and respect.⁵³ A constant challenge in contemporary urbanization is, therefore, how to establish the necessary pre-conditions for these ordinary virtues to flourish.

However, the centrality of ethics, especially in a technologically mediated urban environment, does not only reside in the moral quality of a face-to-face intersubjective relation. M's moral horizon is first enabled by her ethical perception constituted from the streams of information she perceives through social media and interactive

50 Haidt, J. and Kesebir, S. (2010), 800.

51 Greene, Joshua D. (2013). *Moral Tribes: Emotion, reason, and the gap between us and them*. New York; Penguin, 139.

52 Ignatieff, Michael (2017). *The ordinary virtues: Moral order in a divided world*. Cambridge; Harvard University Press, 52-56.

53 *Ibid.*, p. 52.

encounters afforded by urban life. In other words, this technologically mediated urban environment affords a broadening of M's ethical perceptions, which can also alter M's moral horizon.⁵⁴ Through the different technological platforms enabled by the urban condition, M now maintains an enlarged but invisible relationship with an unspecified number of new neighbors and their concerns, which may come to impinge on M's obliged care.⁵⁵ Unlike Bodo's experience, M understands that her local actions would have far wider global consequences. For instance, the fossil fuels that M uses affect the common atmosphere, and her decision for vaccination will impact the global spread of deadly diseases.⁵⁶

And the contemporary urban environment often presents novel objects of contentious conflict, for instance, in the controversially expensive redevelopment of Les Halles in Paris.⁵⁷ On this project, M may conflict with others who share neither her values nor interests, and who may even go as far as attacking her position in irascible ways. To co-exist in the same city then, there is a need for constant dialogues between conflicting perspectives that constitute the process of public reasoning.⁵⁸ Furthermore, the urban environment, which concentrates people in high-density living, also has a tendency to accentuate the public bad. Pollution and infectious diseases are notable examples of public bad, and problems associated with public bad are notoriously difficult to solve because they originate from an aggregate of individual behaviors that are rational and beneficial at this level, but that generate unintended and undesirable consequences at a societal scale.⁵⁹ For instance, it may be beneficial for M's neighbor to practice apartment sharing; but a growing aggregation of such sharing practices institutionalized in the form of Airbnb is likely to lead to undesirable consequences of rising rents and plausible evictions that will impact everyone in M's neighborhood.

Therefore, in at least these three ways—namely, the extensive broadening of one's moral horizon, the urgent necessity to define new ways of resolving urban conflicts, and the tendency for individually rational behaviors to culminate to undesirable impacts—the urban environment brings about new challenges and risks that shape M's ethical experiences with others in the city, which contrasts radically with Bodo's own experience. Furthermore, the urban environment can complicate M's

54 Imamichi, Tomonobu (2009). *An introduction to Eco-Ethica*. Lanham; University Press of America, 57.

55 *Ibid.*, p. 12.

56 Nussbaum, Martha C. (2019), 207.

57 Chrisafis, Angélique (2016), Paris hopes €1bn revamp of Les Halles can become city's 'beating heart'. *The Guardian*, <https://www.theguardian.com/world/2016/feb/01/paris-hopes-1bn-revamp-of-les-halles-can-become-citys-beating-heart> (accessed: 28 December 2019).

58 Sen, Amartya (2005), Human rights and capabilities, *Journal of Human Development*, 6(2), 160.

59 De Graaf, Nan Dirk and Wiertz, Dingeman (2019). *Societal problems as public bads*. New York; Routledge, xii.

ethical reasoning on these challenges in the following two ways. First, the urban environment exposes M to many more emotional reactions and social influences, which can come to compound her ethical reasoning, but, according to Williams, it may also offer resources for tackling these challenges.⁶⁰ And second, the urban environment foregrounds the element of risk that can complicate ethical reasoning. How is M to know what is the right to do when she can never know the full effects of her actions—especially in view of the dynamic interactions of many social actors in the city?⁶¹

The challenges that the urban environment pose go beyond the practical ethical question of ‘what ought the moral agent do’. Instead, they also implicate the procedural ethical questions of, ‘how to flourish together’, and ineluctably, the substantive ethical questions on the aspirations and teleology of urban civilization. In these three different ways then—the practical question of ethical action in novel technological circumstances, the procedural question of how to flourish together despite value pluralism, and the substantive question of what an ethically good urban civilization should consist of—the urban ethics required by a planetary *Gesellschaft* today far exceeds Bodo’s ethics of the *Gemeinschaft*. However, urban ethics remains largely a work-in-progress, and a fuller specification is the work of many researchers and practitioners committed to working out the connections between urbanization and ethics. But one point is worth iterating: without a fuller articulation of urban ethics, it may be impossible to define the moral guidance necessary for planetary urbanization—a milieu that will pose new challenges and problems of unequivocal moral significance.

The AI-powered smart city in planetary urbanization

Following this, the next task is to connect urban studies with AI: What is the AI-powered smart city, and how does it impact the present notion of planetary urbanization? Two caveats are in order before addressing these questions.

First, the ‘AI-powered smart city’ is not a common description of the ‘smart city’. While there is no common definition of a smart city,⁶² there is, however, some consensus that the smart city at least revolves around the use of digital technologies to improve operation, management, and the solution of urban problems; and that data is produced by the city, collected and then processed by specialized algorithms

60 Williams, B. (2006), 195.

61 Hansson, Sven O. (2013). *The ethics of risk: Ethical analysis in an uncertain world*, New York; Palgrave, 1.

62 Grossi, Giuseppe and Pianezzi, Daniela (2017), Smart cities: Utopia or neoliberal ideology? *Cities*, 69, 79-85.

to facilitate more efficient and effective municipal operations.⁶³ The explicit acknowledgment that AI algorithms process and then learn from urban big data is a recent turn in the smart city discourse.⁶⁴ Nevertheless, the prospect of a ‘smarter smart city’ is increasingly coming into sharper focus.⁶⁵ In these smarter smart cities, the urban environment is projected as an autonomous system comprising of a number of other ‘smart’ sub-systems—for instance, driverless vehicles, sensing and monitoring technologies—that in concert harvest data ceaselessly, continuously learn from new data and improve by performing self-correction autonomously. Although a complete smarter smart city has yet to be built, AI technologies that make up the different modules required in this type of smart city already exist—for example, they are observed in the nearly fully autonomous vehicles on the roads today, or the algorithms that can quite accurately predict the choice of one’s future purchases based on learning from the record of past purchases. In recognizing that this is likely the future direction of the smart city replete with many significant ethical issues, this article, therefore, uses this newer phrase of ‘AI-powered smart city’ to reflect empirical developments more accurately.

Second, the respective discourses on the smart city and planetary urbanization have so far largely taken place on two separate sites within urban studies. These two discourses have yet to connect or overlap in any systematic ways even when the management of a rapidly growing urban territory is likely to be more robustly facilitated by AI-powered smart technologies. Why is there then a gap between these two discourses? One plausible explanation suggests that these are two categorically distinct discourses operating at different scales within urban studies. While the AI-powered smart city is largely a functional discourse—for instance, revolving around questions on how to create more efficient ways of managing different municipal functions, or more effective ways for eliminating waste and improving sustainable commitments in the city—the planetary urbanization discourse is instead focused on theorizing new concepts and methodologies that are more adequate to describe the patterns of contemporary urbanization. This attribute then qualifies planetary urbanization as a discourse largely concerned with epistemology.⁶⁶

These obvious differences, however, conceal similarities. A standing critique of the AI-powered smart city is that it represents a new kind of “technology-led urban

63 Li, Wenwen, Batty, Michael and Goodchild, Michael F. (2019), Real-time GIS for smart cities, *International Journal of Geographical Information Science*. DOI: 10.1080/13658816.2019.1673397.

64 Allam, Zaheer and Dhunny, Zaynah A. (2019), On big data, artificial intelligence and smart cities, *Cities*, 89, 80-91.

65 Woyke, Elizabeth (2018), A smarter smart city, *MIT Technology Review*, <https://www.technologyreview.com/s/610249/a-smarter-smart-city/> (accessed 28 December, 2019).

66 Brenner, Neil (2018), Debating planetary urbanization: For an engaged pluralism, *Environment and Planning D: Society and Space*. DOI: 10.1177/0263775818757510.

utopia⁶⁷—an urban environment where a multitude of urban problems from traffic congestion and sustainability commitments, to crime and economic stagnation, could be resolved through the application of advanced technologies.⁶⁸ In turn, this kind of technological utopia reduces urban politics to the post-political of “solutionism”,⁶⁹ where the challenge is to choose from different pre-packaged technological options merely distinguished by different trade-offs. As it stands, this form of specialist-directed ‘technological-led urban utopia’ has a tendency to broaden the field of action of technicians, consultants, and private companies while restricting the roles of citizen action through constructive agonism.⁷⁰ Similarly, planetary urbanization has been explained as a side-effect of capitalism.⁷¹ To ensure its relentless growth, capitalism has to expand continuously—and there is no better way to do this than through large-scale urbanization.⁷² The process of urbanization absorbs large amounts of surplus capital while creating new channels for capital accumulation. Consider any typical new suburb.⁷³ A typical homeowner and his family living in an American suburb would require an entire ecosystem of products and services—a house, cars, TVs, lawn-mowers, and lawn-mowing services among others; supermarkets, gas-stations, clinics, schools and more—that not only absorb and engage surplus capital productively, but also are new conduits for capital accumulation as well. Framed by these critical narratives, both the AI-powered smart city and planetary urbanization are intricately connected to the perpetuating regime of capitalism.

But this is also where the similarities end because, in spite of their emerging convergence, the incompatibilities between the AI-powered smart city and planetary urbanization are more salient. To further connect the AI-powered smart city to planetary urbanization then will require making the following arguments, comprising two parts: that despite their incompatibilities and differences, they nevertheless converge in substantive ways that will likely change the nature of urbanization.

First, and as aforementioned in the Introduction, the process of planetary urbanization is uneven. One projection shows that for the remaining decades of the twenty-first century, most of the urban growth will come from the global south.⁷⁴ And much

67 Hollands, Robert G. (2015), Critical interventions into the corporate smart city, *Cambridge Journal of Regions, Economy and Society*, 8, 61-77.

68 Ibid., p. 61.

69 Jewell, M. (2018), p. 213.

70 Vanolo, Alberto, (2014), Smartmentality: The smart city as disciplinary strategy. *Urban Studies*, 51(5), 883-898.

71 Harvey, David (1996), Cities or urbanization? *City*, 1(1-2), 38-61.

72 Harvey, David (2010). *The enigma of capital and the crises of capitalism*. London; Profile Books, 166.

73 Ibid., p. 106-107.

74 Parnell, S., Elmqvist, T., McPhearson, T., Nagendra, H. and Sorlin, S. (2018), 7.

of this urban fabric will struggle to provide even the most basic living amenities, and concerns of livability rather being ‘smart’ by AI-powered urban technologies, are likely to be prioritized.⁷⁵ In stark contrast, affluent cities of OECD countries are generally more equipped to experiment with the advances of AI-powered urban technologies.⁷⁶ Sponsored by private corporations with clear profit-driven motives, the urban environments of developed economies present ready-made ecologies where AI-powered technologies can capitalize on commercially relevant insights from consumers’ data on the one hand, and on the other hand, where affluent citizens, who are generally more urbane and educated, readily participate in the digitization of their everyday life. While this does not obviate the fact that in these affluent cities there exist a multitude of poor, the elderly and the uneducated, who, for different reasons, do not participate in this digital economy and society,⁷⁷ AI-powered urban technologies—and their corporate sponsors—nevertheless tend to gravitate to more affluent urban environments for the reasons earlier explicated.

Despite these incompatibilities, neither the tide of AI-powered urban technologies nor the trend of planetary urbanization has relented. In all likelihood, and in spite of the uneven nature of planetary urbanization, parts of the global south will not follow existing approaches of urbanization by prioritizing large-scale technological solutions and infrastructures, but rather, embody newer, more holistic and sustainable approaches.⁷⁸ Importantly, the speed at which the global south is urbanizing also requires a more agile and strategic adoption of AI-powered smart technologies. Instead of a top-down and capital-intensive approach of embedding sensors in large-scale infrastructural systems such as roadways and buildings, AI-powered smart technologies are more likely to be strategically implemented by citizen groups networking with other data-driven groups and small coalitions to exchange products, services and insights. This approach empowers citizens and enables them to actualize their collective ethical visions. AI-powered technologies used in these ways naturalize participation and are swifter in responding to community needs and priorities.⁷⁹

75 Singh, Gurbir (2018), A chimera called “Smart Cities”, in: Elmqvist, Thomas; Bai, Xuemei; Frantzeskaski, Niki; Griffith, Corrie; Maddox, David; McPhearson, Timon; Parnell, Susan; Romeo-Lankao, Patricia; Simon, David and Watkins, Mark eds., *The Urban Planet: Knowledge towards sustainable cities*, Cambridge University Press; New York 2018, 368-370.

76 Man, Ulrich; Giest, Sarah and Baar, Thomas, (2018), Can Big Data make a difference for urban management? In: Elmqvist, Thomas; Bai, Xuemei; Frantzeskaski, Niki; Griffith, Corrie; Maddox, David; McPhearson, Timon; Parnell, Susan; Romeo-Lankao, Patricia; Simon, David and Watkins, Mark eds., *The Urban Planet: Knowledge towards sustainable cities*, Cambridge University Press; New York 2018, 218-238.

77 Warf, Barney (2018), Digital technologies and reconfiguration of urban space, in: Ward, Kevin; Jonas, Andrew E. G., Miller, Byron and Wilson, David eds., *The Routledge Handbook on Spaces of Urban Politics*, Routledge; New York 2018, 96.

78 Parnell, S., Elmqvist, T., McPhearson, T., Nagendra, H. and Sorlin, S. (2018), 8.

79 Wilson, Bev and Chakraborty, Arnab, (2019), Planning smart(er) cities: The promise of civic technology, *Journal of Urban Technology*, 26(4), 29-51.

While the respective tide of AI-powered urban technologies and that of planetary urbanization has yet to fully collide, it is only a matter of time before the former makes a significant impact on the latter.

Second, if planetary urbanization is simply defined as an absolute expansion of the urban fabric and its requisite technosphere, then its connection to the AI-powered smart city becomes even clearer. In this way, the AI-powered smart city has been framed as a panacea for many problems associated with rapid urbanization.⁸⁰ For example, beyond the digital simulation and monitoring of dynamic traffic patterns afforded by big data, researchers are teaching algorithms to forecast traffic patterns with the overall objective of mitigating traffic congestion.⁸¹ Municipal authorities are likely to see these new AI-powered urban technologies not only as instrumental means for more efficient or effective management of otherwise complex problems, but also importantly, as a form of statecraft that can help to visualize, and order, an otherwise ‘wicked’ and chaotic reality.⁸² But precisely because the problems associated with rapid urbanization are ‘wicked problems’,⁸³ where addressing the problems even with advanced technological solutions tend to alter the original problems, a direct application of AI-powered urban technologies is likely to change the urban environment in ways that cannot be fully anticipated beforehand.

For example, the innovative use of algorithms to match unhoused people to the most appropriate available housing resources exacerbated the vulnerabilities of these already vulnerable individuals.⁸⁴ This is because many basic conditions of being homeless, for instance, sleeping on the pavement, or going to the bathroom on the street, are also crimes. Once a homeless individual has been given a ticket for these offenses, and if this individual does not or cannot afford to pay the fine, then this individual has effectively turned into a fugitive person, and the AI database also becomes a database for locating fugitives. In this way, what started as instrumentalizing AI for matching unhoused individuals to available housing resources turned into a resource portal that law enforcement agencies can leverage in undesirable ways.

80 Kummitha, Rama Krishna Reddy and Crutzen, Nathalie, (2017), How do we understand smart cities? An evolutionary perspective, *Cities*, 67, 43-52.

81 Laris, Michael (2019), Researchers are trying to teach computers to forecast traffic like the weather. *The Washington Post*, https://www.washingtonpost.com/local/trafficandcommuting/this-company-is-trying-to-teach-computers-to-forecast-traffic-like-the-weather/2019/12/27/d08d2ecc-2287-11ea-86f3-3b5019d451db_story.html (accessed 28 December, 2019).

82 Scott, James C. (1998). *Seeing like a state: How certain schemes to improve the human condition have failed*. New Haven: Yale University Press, 82.

83 Rittel, Horst W.J. and Webber, Melvin M., (1973), Dilemmas in a General Theory of Planning, *Policy Sciences*, 4(2), 155-169.

84 Eubanks, Virginia (2018), High-Tech Homelessness. *American Scientist*, <https://www.americanscientist.org/article/high-tech-homelessness> (accessed 28 December, 2019).

AI-powered urban technologies can also transform urbanization in another way. Not only are cities the key driver of AI's role in the global economy, but also that the overall shift toward widespread deployment of AI technologies will likely trigger major political changes in cities—for instance, by displacing workers that are most susceptible to be replaced by autonomous AI technologies in the near term.⁸⁵ In tandem, 'intelligent' urban technologies are transforming how people interact with each other, as well as the nature of urban politics. As urban big data becomes increasingly commodified, whoever controls the production and use of this data also commands the political power in cities.⁸⁶

The ethics of the AI-powered smart city

In this final dyadic pair, AI-powered urban technologies will be connected to ethics: How does the AI-powered smart city change ethical agencies, and in which specific ways? There are at least two important ways that the AI-powered smart city can moderate ethical agencies.

First, many of the ethical issues raised by the smart city revolve around data practices: how data is collected, processed, shared, and used, as well as the justifications and undesirable side-effects of these practices.⁸⁷ One recurring issue is how urban residents are captive populations who cannot opt out of direct or indirect data collection in a smart city without paying a steep price in safety, convenience, and quality of life.⁸⁸ Conversely, to enjoy the safety, convenience, and a good urban life, they would have to consent, even involuntarily, to the constant threat of privacy rights infringement and ubiquitous surveillance. Importantly, for people living in a smart city, this is never about a one-time hard question of trading off some freedom for more convenience. Instead, and irrevocably, this ethical decision has been made on one's behalf, for all times to come, insofar as one has decided to live in a smart city. To recall the contrastive lives of Bodo and M, the smart city offers many functional freedoms to M—for instance, the convenience of ordering cooked food online, or to communicate virtually with many others at once—but these freedoms come

85 Pervane, Timocin and Gu, Kaijia (2019), How cities should prepare for artificial intelligence. *MIT Sloan Management Review*, <https://sloanreview.mit.edu/article/how-cities-should-prepare-for-artificial-intelligence/> (accessed 28 December, 2019).

86 Morozov, Evgeny and Bria, Francesca (2018). *Rethinking the smart city: Democratizing urban technology*. New York; Rosa Luxemburg Stiftung, 21.

87 Kitchin, Rob (2016), The ethics of smart cities and urban science, *Philosophical Transactions A*, 374: 20160115.

88 Finch, Kelsey and Tene, Omer (2016), Welcome to the Metropticon: Protecting privacy in a hyperconnected town, *Fordham Urban Law Journal*, 41(5), 1596.

with a paradoxical unfreedom to challenge the primary conditions underlying one's existence, which is not unlike Bodo's milieu.

And at the rate of generating nearly 2.5 quintillion bytes of data today—and rising—this big data has to be processed by algorithms that come with new risks.⁸⁹ One such risk consists of public agencies or corporations inferring personal or sensitive knowledge about an individual, without his or her consent, while correlating different sets of big data.⁹⁰ Unless specifically programmed, algorithms do not understand the difference between functional and unfair correlations.⁹¹ In other words, algorithms functioning to draw out correlations would distill every bit of correlated information if they have not been constrained to filter inappropriately racist or sexist correlations. Furthermore, the specification of these algorithms often entails making hard choices—should the designer specify these algorithms to reflect fairness or accuracy? Consider an example of applying a bank loan for home-ownership, which undergirds neoliberal urban policies in many cities. An individual, who lives below the poverty line, is statistically speaking and in line with observed facts, less likely to repay a loan. Algorithms that are specified to be accurate with respect to observed loan data will tend to deny a loan to this individual—but this compounds injustice by punishing people for being poor and exacerbating a positive feedback loop.⁹² It is, therefore, no surprise that the neoliberal city tends to exemplify the Matthew Effect, where the wealthy own ever more properties while the poor become poorer. When algorithms are not only automated in inferring from data but also in making automated decisions on behalf of moral agents, they start changing the world according to the ethical direction in which they have been molded.⁹³

On this, one might imagine that these algorithms could be tweaked to favor justice a little more. However, doing so by deliberately making these algorithms less accurate would result in granting loans to people who are not likely to repay and deny loans to people who would actually repay.⁹⁴ In other words, these algorithms would have to be designed to admit more false positive than false negative results, which is a hard choice that human agents must make.⁹⁵ Inadvertently, the ethical implication of this decision to favor justice goes beyond just being fair—and applying the Categorical Imperative here is revealing. Suppose if every bank does this, then what

89 Herschel, Richard and Miori, Virginia M. (2017). Ethics & Big Data, *Technology in Society*, 49, 31-36.

90 Kitchin, R. (2016).

91 Kearns, Michael and Roth, Aaron (2020). *The ethical algorithm: The science of socially aware algorithm design*. New York; Oxford University Press, 57-60.

92 Ibid., p. 193.

93 Ibid., p. 193.

94 Ibid., p. 70.

95 Ibid., p. 71.

might have started as fairer but less accurate algorithms would result in a paradox where even fiscally responsible individuals prefer to engage in fiscally irresponsible behaviors in order to better qualify for a loan. In sum, if more accurate algorithms result in reinforcing poverty, but if less accurate—characterized as somewhat ‘fairer’, ‘more compassionate’ or ‘ethically interventionistic’—algorithms result in paradoxical injustice, then it would appear that such AI technologies have hardly automated ethics; they have merely rendered the need for ethical judgment even more salient. Every automation by AI technologies conceals ethical trade-offs that these technologies remain unready to address. And designing algorithms to generate a random result as a proxy for fairness also does not work. After all, rolling dice will not generate good chess moves or good ethics.⁹⁶ While it is unclear to what extent such AI technologies have seeped into the everyday operation of the smart city, it is however quite certain that if the smart city is data-driven and data-dependent, and if such data is mined for actionable insights, then this general visual of an emerging area of ethical perplexity as depicted cannot be far from true.

In recognizing these issues, ethical principles—tantamount to an ethical code for AI—have been advanced to guide AI practices and to mitigate the risks that AI can bring about. Many different principles have been proposed, and researchers have embarked on the descriptive ethical task of mapping their convergences, as well as divergences.⁹⁷ Other efforts have instead aimed to define a set of core principles, for instance, and namely, the principle of beneficence, non-maleficence, autonomy, justice, and explicability.⁹⁸ The efficacies of these two different approaches—mapping and narrowing respectively—are still being debated. While the former approach has been effective in discovering gaps among the different principles—for instance, that the principle of sustainability remains under-represented in AI even when AI technologies are polluting systems⁹⁹—the latter approach excels in summing what appears to be an intractable number of principles into a handful of key principles. In surveying these efforts to define a functional code of AI ethics, other researchers have instead argued that such high-level principles tend to provide a cover for business-as-usual on the one hand, and on the other hand, they also tend to develop the moral

96 Bostrom, Nick and Yudkowsky, Eliezer (2014), The ethics of artificial intelligence, in: Frankish, Keith and Ramsey William M. eds., *The Cambridge Handbook of Artificial Intelligence*, Cambridge University Press; New York 2014, 332.

97 Jobin, Anna; Ienca, Marcello and Vayena, Effy, (2019), The global landscape of AI ethics guidelines. *Nature Machine Intelligence*, 1, 389-399.

98 Floridi, Luciano and Cows, Josh, (2019), A unified framework of five principles for AI in society, *Harvard Data Science Review*, <https://hdsr.mitpress.mit.edu/pub/l0jsh9d1> (accessed 28 December, 2019).

99 Jobin, A., Ienca, M. & Vayena, E. (2019).

hazard of oversimplifying deep ethical perplexities in order to conform to the clarity of agreed-upon principles.¹⁰⁰

But similar to any exercise of proposing ideal and axiomatic principles, these principles can conflict in practice.¹⁰¹ To maximize autonomy, that is, non-interference in an individual's life, is likely to imply a limitation on beneficence, that is, doing more good through benevolent but paternalistic technologies. Similarly, and as discussed, beneficence at a local level by offering more loans to the poor may, in the end, be contradicted by injustice at a higher level, where people are driven to behave badly in order to better qualify for these loans. If the attempts to consolidate a clearer ground for ethical AI principles are underway, then they have also unintentionally surfaced the paradoxical prospects of this clarity.

Conclusion

This article aims to describe a knowledge gap bounded by three emerging domains, namely, urban ethics, the AI-powered smart city in the context of planetary urbanization, and AI ethics. As discussed, planetary urbanization is the powerhouse of big data, which vitalizes AI technologies. In turn, deploying AI technologies in smart cities transforms the ethical relations between people in unprecedented ways. However, neither urban ethics nor AI ethics at present are adequate to address the novel challenges of the AI-powered smart city. This is especially alarming when AI technologies are beginning to take on cognitive work with social dimensions and consequences.¹⁰² This knowledge gap then outlines a pathway for further research in the convergence of ethics, urban studies, and applied AI.

However, this convergence is neither necessary nor inevitable. Plans for the 'smarter smart city' of Quayside in Toronto has been abandoned by its designers.¹⁰³ The outcome of Quayside demonstrates that it is possible to concede to an urban way of life, and perhaps, also a planetary *Gesellschaft*, without accepting the extensive reach of datafication and monitoring coterminous with the AI-powered smart city. In this way, the resistance to Quayside—and the comprehensive AI-powered urban vision that it has come to represent—is as much a political decision as it is also an ethical rejection. Furthermore, as discussed, the global south is likely to engage with

100 Mittelstadt, Brent, (2019), Principles alone cannot guarantee ethical AI, *Nature Machine Intelligence*, DOI: 10.1038/s42256-019-0114-4.

101 Berlin, Isaiah (2002). *The power of ideas*. Princeton; Princeton University Press, 22.

102 Bostrom, Nick and Yudkowsky, Eliezer (2014), 317.

103 Cecco, Leyland (2020), Google affiliate Sidewalk Labs abruptly abandons Toronto smart city project. *The Guardian*, <https://www.theguardian.com/technology/2020/may/07/google-sidewalk-labs-toronto-smart-city-abandoned> (accessed 20 May, 2020).

AI technologies differently. This engagement is more piecemeal in nature, citizen-led, and empowering communities rather than corporations when compared to engagements in the global north. For this reason, the political and ethical compact between people and AI technologies in the global south is likely to take a different course replete with new research and activism opportunities.

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Urbana etika planetarne urbanizacije kojom upravlja umjetna inteligencija

SAŽETAK

Do 2100. svijet bi mogao biti u potpunosti urbaniziran osobama koje žive samo u gradovima. Ova neposredna stvarnost planetarne urbanizacije vjerojatno će dovesti do drastičnih okolišnih, ekonomskih i društvenih promjena, a sve će zauzvrat vjerojatno utjecati na prirodu ljudskih odnosa i njihovu interakciju u gradovima. Urbana etika stoga se bavi pitanjem kakvi bi trebali biti pravi odnosi među ljudima koji sve više nastanjuju gradove. Ovo se pitanje danas sastoji od porasta 'pametnijih pametnih gradova', gdje su urbane tehnologije omogućene umjetnom inteligencijom (UI) koja može osjetiti, pratiti, učiti, predvidjeti, a zatim pokušati kontrolirati ljudsko ponašanje. Brzo spajanje ovih triju razvoja, planetarne urbanizacije, urbane etike i pametnih gradova, čije upravljanje je potpomognuto umjetnom inteligencijom, otkriva nedovoljno istražen scenarij prepun novih društvenih obećanja prekrivenih mnogim moralnim opasnostima. U radu će se ispitati sljedeći scenarij, koji je uokviren sljedećim trima vektorima: (i) Kako urbano oblikuje etičko? (ii) Što je pametni grad kojim upravlja UI i kako utječe na sadašnji pojam planetarne urbanizacije? (iii) Kako pametni grad kojim upravlja UI mijenja etičko djelovanje i specifični načini na koji to čini? Zajedno, odgovori na ova pitanja započinjaju daljnje rasprave o urbanoj bioetici u miljeu gradova kojima upravlja UI.

Cljučne riječi: planetarna urbanizacija, urbana etika, umjetna inteligencija, pametni grad, etički algoritmi.