ISSN: 2378-1017 *Philosophy of the City Journal* 1, no. 1 (2023)

The Ethics of Mapping Slums—and How AI Complicates the Picture

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Abstract

This is an interview conducted with Isaac Oluoch (Twente) and Michael Nagenborg (Twente) on 1 March 2023. It is about their research on mapping deprived areas in lower-income countries, better known as slums or informal settlements. They talk about technical and especially ethical challenges involved in practical mapping projects, and also discuss what complications may arise when machines (AI) start participating in interpretations of spaces. We also discuss our situatedness as researchers in wealthy countries, the practice of philosophy in general and how it might contribute to concrete real-world problems.

Keywords: ethics; applied philosophy; mapping; deprived areas; Global South

Transcript

Tea: What is a slum, that is, how do you define deprived living conditions?

Isaac: It is often about morphological aspects—so the building structure—but also where exactly the place is, its environmental situatedness along with economic factors such as proximity to resources or healthcare or job facilities, as well as more cultural ideas of what exactly it means to be impoverished. Because if you look at what typical neighborhoods in low-income countries or cities look like, you get much more variability between a "rich" house and the houses which you would call "poor" or "middle-income". So, it is about looking at the entire area, and you might get a lot more variability than if you just say, "Here is a slum; here is not a slum." There is not such a clear-cut distinction between one and the other.

Michael: For me, even though I come from a more Western perspective, it's about people who must live without that which we take for granted, so basic infrastructure like a sewage system, access to clean water, access to health care services, waste management. All the things that make European cities such nice places to live that do not exist in other places. And we are talking about 1 out of 8 people living on this planet who live in these kinds of conditions. And these numbers are probably too low.

Lobo, Tea. 2023. "The Ethics of Mapping Slums—and How AI Complicates the Picture". *Philosophy of the City Journal* 1, no. 1, 127–134. https://doi.org/10.21827/potcj.1.1.41025

Tea: You argue that official census data on cities often omit large deprived areas. However, precise data on these areas is urgently needed so that concrete steps can be taken to improve the living conditions there. Why does this happen, and what can remedy it?

Isaac: I think the leading problem is two-fold. The first aspect is that these spaces are growing too rapidly for their own good. Being able to make a good census means being able to allocate specific resources to find where people are in the city. But as urbanization in these low-income countries increases, so does the difficulty in finding the funds to properly take care of people. Because the populations are rising too quickly, it is becoming impossible to know who exactly is coming into the city. And so the slums grow at a much faster rate than cities can accommodate.

The second aspect [is] a bit more negative, or nefarious, perhaps. Most cities would not want to take account of whether people are in the slums, either because of planning situations where they want to take care of private stakeholders who want the land on which the slums are growing. Therefore, it's much easier to say "Here is some land you can take over", or "Here is some land which you can build on", even though there are people living there. And so most slum communities end up being evicted, forced out for the sake of these private stakeholders.

Michael: Nobody might feel responsible for counting the inhabitants of these settlements. We also learned about policies completely backfiring: For example, I think it's an Indian law that states that municipalities must provide basic infrastructure when they recognize an area as a slum. And of course, if the municipality itself doesn't have enough budget, then everybody goes like "What slum? We don't see any slum here." So, there might be very strange incentives for the local authorities not to account for what is there. And let's not forget that also sometimes the inhabitants don't have an interest in being mapped or being counted, because of the risk of an eviction that is already has been mentioned. Maybe you don't want other people to know how many people you are and where you live.

Tea: Counting and mapping are intimately connected because when you map, you make visible who is counted, who counts. And as you already suggested, this is not such a straightforward thing. It's not exactly like you're representing reality as it is, but you're making decisions that influence how this reality is interpreted or viewed. So, you could argue, if I may gloss it this way, that maps are in some ways performative. They turn something into truth rather than simply objectively reporting on what is there. And can you give some examples on this?

Isaac: I believe that one of the most famous or most talked about examples, in the geographical circles anyway, is the Mercator projection. Our geographical consciousness is so shaped by this projection whereby you have the so-called global north looking a lot bigger, looking a lot more vital to the way the world looks to in comparison to the so-called Global South. And this, of course, has its own sort of knock-on effects of situating specific countries as more powerful or more important to how the world develops.

Another example is borders. Country boundaries are drawn up to look as if they're objectively there on the earth. But for most people who, let's say, are of a more nomadic culture, these boundaries make no sense whatsoever. And in most cases, they're drawn up by people who are not in the country itself, but by external powers. So, these lines which, are drawn on pieces of paper, divide up places in the world like pieces of cake, as some illustrations show. For instance, the Berlin Conference of the late 19th century could be considered as leading to the way that Africa was carved up into distinct areas.

Michael: And in my own work, I like to think about maps as not so much concerned about what is there, but what there could be. It's more about mapping potentials, what you could do there, where you could go, what can be, how the world can be changed rather than what the world is. So that was my way of making sense of all these different layers of different quality of data that is being projected on maps. Maps are very confusing objects from an ontological and epistemological perspective. But maybe it's not so much about the ontology of what is there, but what people try to do there or what could be done there and how they discover potentials in those areas.

Tea: So, it's more about what maps do than what they represent.

Isaac: Yes, and one of the most comical examples, of course, is people who follow Google Maps almost to a fault whereby they end up driving into ditches, driving into lakes, taking the representation of Google Maps at face value instead of looking at the actual road that they're on. So again, this statement of truth becomes so much more embodied than just thinking of maps as neutral objects that I trust them so much I won't even look at the world around me.

Michael: Also, what I find super fascinating about maps is that they have become everyday objects thanks to smartphones. We take them to be very easy to read, as an intuitively graspable piece of information. But once you start looking into the process [of] how maps have been produced, it becomes anything but intuitive what you are looking at.

Tea: What are some of the specifically ethical challenges when mapping deprived areas in general, and how does AI complicate the picture?

Isaac: I think one of the leading ones is the fact that most of this research is being done by Western countries or by Western researchers who are not always in very close contact or any actual contacts with the people whose spaces they're mapping. Now, this is perhaps difficult because of, of course, the geographical distance between the people mapping and the people being mapped, as well as the fact that not all the research being done in this area goes out to the people. It remains in research silos. So, in this case, it's somewhat like experiments being done by people in a laboratory which do not always go out into the world until they have some real-world applications. But there is, of course, the concern that as researchers do go out to meet the communities, they often end up making promises which do not always end up leading to the data going back to the communities themselves. So the research ends up staying with the researchers. The finalized map products may end up going to certain private institutions, whether it's World Bank, for instance, or certain governmental municipal authorities. But the communities are often left in the dark. And so the data justice concern is quite important in this case because as data is "the new oil", as it's been said over the last couple of I think the last decade or so, this oil is not going out to the people who need it the most.

It is also about the transparency or lack thereof with regards to how these algorithms lead to the classifications that they make, because it's very easy for someone to say my algorithm has 85% accuracy, therefore you should trust it. But in a research environment, this can be much more easily broken down to well, use this kind of training, this modeling, etcetera, and so on. But for those who may not speak the same language as the researchers, this accuracy idea does not really translate very properly. And if you're going to make any policy decisions based off of this concern for accuracy, then there should be a good way of explaining how you got there or what potential fuzzy boundaries there may be with regards to how these boundaries are drawn up. Nothing is as objective as claiming this is a slum, and that is not a slum. So, a way of explaining that in the final product of these algorithms or these models is very, very necessary.

Michael: And I would say, in general, accountability is more complicated once you use machine learning because that's another high-tech aspect. If you say we want to have people participate in the decision-making on the ground, then you need to acknowledge that the people in deprived areas most likely will not have the highest of educational standards. So that makes participation quite hard. And when machine learning comes into place, it becomes even harder.

Take our "Do No Harm" project,[1] for example, where we work together with people from 510 Global and the Red Cross Data Science Group, and where we try to identify weak building structures which are likely to be affected by heavy rain. There, you really have a very clear-cut accountability problem because if you make the wrong predictions and the flood doesn't turn out as simulated and predicted and measured, then you should be able to explain to people why you made a mistake, and I think it's a little bit too easy to say, "Well, the computer said so, so sorry, guys."

On the one hand, machine learning adds a lot of ease and convenience to the process, but at the same time, it is a question about how much time do you need to invest in order to be accountable and to audit the systems that we have. For me, being a responsible agency using this kind of technology also means you need to invest some time in order to make sure that you are auditing for local variations.

Tea: We have come to a point when machines are participating in the interpretation of spaces. Mapping is a way of making spaces legible, making them intelligible, interpreting them. And as you also mentioned, Isaac, it's important that actual communities be involved in, participate in the interpretation of their own spaces. But as is the case with machine hermeneutics, a new concept that came up that you guys also mention in your joint paper,[2] this is not always possible because, as Michael mentioned, sometimes the level of education is not high enough, and there's also no access to schooling in machine learning.

I think that here Miranda Fricker's concept of hermeneutical injustice[3] is very useful because she says it's a matter of justice that people participate in our collective interpretative endeavors, in a collective making sense about things that pertain to them, and these spaces pertain to them. How do machine hermeneutics play into the notion of hermeneutical injustice?

Isaac: I like that notion of hermeneutical injustice because,indeed, the fact that maps are being used to read the area, make legible these areas in this more governmental sense is problematic. Because if the machines are only doing this from one side, from the side of, let's say, the researchers or from the side of the government, municipal authorities who want to make some policy decisions, those who are being read by the machines are not part of the process. Then, immediately, you have a concern wherein those who are being mapped remain invisible or remain voiceless, and the map continually speaks over them. The machines, in this case, also continually speak over them. So being able to account for this is very, very important.

Or being able to mention this and make this very clear that the objective reality, which the maps are supposedly projecting out there, as Michael mentioned, is not very objectively clear because if there is enough bias in the mapping training or in the labeling process of classifying where these areas are, you're going to have a situation where places which do exist don't end up existing on the

[1] See: https://www.nwo.nl/en/projects/mvi19007

[2] Cf. Isaac Oluoch, Monika Kuffer, and Michael Nagenborg, "In-between the Lines and Pixels: Cartography's Transition from Tool of the State to Humanitarian Mapping of Deprived Urban Areas," *Digital Society* 1, no. 5, 2022. https://doi.org/10.1007/s44206-022-00008-0.

[3] Cf. Miranda Fricker, "Hermeneutical Injustice," in *Epistemic Injustice: Power & Ethics of Knowing*, Oxford University Press, 2007.

maps. And in this case, if all you have is as a researcher or a government, or a municipal authority, is the map which you're presented with and not going out to the actual place which the map is a map of, then you end up with a situation where you're not really talking about what's in the world itself. You're only talking about what the machine is presenting to you.

Michael: And I also really like the idea of machine hermeneutics because it emphasizes that counting and measuring are indeed hermeneutical activities. It's not always obvious what is a house, what is a household. So that requires interpretation, and that is quite demanding to expect that from a machine. So, in a way, it is a reminder that maybe the task that is actually not very suitable for machines.

But you also need to recognize the limitations of the machinery. Most of the time we work with visual data, and, for example, if you have a nicely newly built housing complex where people are reallocated from a deprived area to what is supposed to be a nice area, but which lacks all kinds of basic infrastructure. If you then only base your judgment on the satellite image, you might say, "Oh yeah. Area of improvement, huh? Clean streets now. Nice buildings. Looks good." But, of course, the satellite data doesn't tell you anything about accessibility or operational ability of basic infrastructure. You don't see if there's water running or not. So, I think it's very important to keep in mind what machines cannot do.

Tea: Isaac, you also focused specifically on challenges and opportunities in mapping deprived areas in the context of COVID-19 management. So, can you tell us something about the challenges and opportunities involved?

Isaac: Perhaps to begin with the opportunities. The main one was that capacity building became very, very important during the pandemic, as is the case in any disaster-related situation. And we…in the paper, I use the definition given to us by UN Habitat and what capacity building is, which is essentially the skill or the capacity of individuals, groups, collectives to have the necessary ability to strengthen their processes or to strengthen their adaptability given in the face of a disaster or in the face of any emergency situations. And COVID completely took everyone by surprise, of course. But at the same time, in the context of slum communities, because they were allegedly already in a marginalized position, the need for understanding where exactly people were, the need for understanding how accessible or inaccessible certain areas are, as Michael also just briefly mentioned, became more and more important. And so this was perhaps the most vital aspect of using geographic information in the context of mapping these communities. And there are many examples of this, whether from the humanitarian OpenStreetMap or other organizations, such as the Demographic Data for Development, who are working with a lot of communities and other participatory actors for making sure that those living in these areas were well taken care of, at least as much as possible.

But there are, of course, more challenges to this as well. I think the fact that it is easy to say, "Yes, be socially distant. Yes, stay at home. Yes, You know, you can wait for X amount of money to be sent by the government," but in the context of communities in the deprived areas, number one, they were often far too close together to be able to actually isolate or to stay away from each other in terms of quarantining. Number two, because they make up a lot of the informal economy of the cities which they're in, they were drastically impoverished because of having to stay at home.

So we in the West, of course, have it much easier: we can stay at home, we can work from home. We have Zoom; we have Teams. We can do whatever we want in terms of working conditions. But for those who are living in these communities, they don't really have that ease of accessibility. So

being able to map these areas makes you understand that it's not just a matter of yes, they complied or, yes, they didn't comply, but why couldn't they comply? And so understanding their more geographical situatedness helps to understand that you cannot dictate these sorts of measures and assume everyone will be able to follow them or everyone is going to be able to comply as easily as possible.

Tea: Can you tell us more about what it is like to participate in fieldwork as a philosopher?

Michael: I have to say, whenever something goes wrong in the fieldwork, I always remember the good old times when we just wrote books—that was so easy, right? But besides all of that, I think there's a there's a really a value in discussing with stakeholders on the ground, trying to understand what you will not find in the books. That's something that I've learned over in my projects where we work together with groups of different people with disabilities and medical conditions in order to better understand where the challenges lie.

If you look back to applied ethics, as we did it when I was a student, a long time ago, applied ethics meant, "Let's look at the newspaper, let's grab a headline, and let's show why Kant was right." And without any reflection on how this news reporting came about, what were the underlying disciplines involved, if there was a discipline involved? It was mostly to illustrate the case that you wanted to make or to show there's an interesting challenge in this particular one. Um, and I don't know if we do it now correctly, maybe we are going in the wrong direction. Sometimes I feel like a bad social scientist. Probably I'm becoming a better ethicist, but by trying to be more conscious about how we relate to real-life cases, how we relate to real-life positions and views. I think it's that we become more flexible in trying to understand what people really need and what they think and where the challenges are lying. And you don't get that from reading newspapers at times.

But there are, of course, also major challenges. One of my colleagues just organized focus groups in poor rural communities to talk about their opinions about drone data acquisition. We spent a lot of time trying to understand what is the level of data literacy that we can expect and what are people familiar with. I mean, even when we now talk about it among ourselves, it's sometimes hard to explain what exactly machine learning is. To understand it all completely, all details. So, we had meetings with locals also working here in Twente. And we learned that WhatsApp is a commonly used tool in these communities. And that was actually our entry point. We said, okay, if you use WhatsApp and there are discussions about data-sharing practices, we can use that as a guiding metaphor to talk about what basically Red Cross is doing. And actually, it was way more easy than we thought to talk about data sharing and to see what people want. And basically, we received confirmation of what we were already expecting. They want something back. So as long as the local communities were under the impression that the data is being collected for benevolent purposes that would serve the community, it wasn't seen as a major thing, but in the moment where somebody would try to make money out of it, and they don't get a share, that was an issue.

What we found interesting is that there was a clear opposition to the idea that you just need to talk to the community leaders. People in the meetings were clearly rejecting this idea: "No, we want to be asked, it's not enough to ask the community leader, since they also have politics, right?" I found that interesting because there is often seen as a minimum requirement. If you cannot get informed consent by all individuals, that you at least talk to community representatives or community leaders. But this discussion clearly showed that once you start talking to individuals, they might disagree and say, "No, I may have a different opinion here."

Tea: Isaac, do you want to add something to that? You also have experience with fieldwork.

Isaac: Unfortunately, I didn't get to because my project started just at the sort of beginning of the pandemic. So just as we were about to get our plans for, you know, potential field opportunities and such, well, of course we couldn't fly anywhere. But one sort of saving grace of that was being able to be in virtual meetings, at least with some colleagues in South America. There, I learned, similarly to Michael's situation, the ground politics. One colleague from South America was telling us how in Brazil, specifically, the mapping situation there is quite funny in the favelas, which is what informal settlements are called in Brazil. They also have a different kind of politics because there are a lot of gangs present in those areas. And it's a very weird triangle relationship, you could say, between the communities, the gangs, and the police. So the police want, of course, to capture the gangs, but at the same time, the people in the communities don't trust the police fully because the police often are abusive or are not so much as understanding of the situation there.

So, in one of the mapping projects, they also involved the gangs in the mapping. Obviously the gangs don't want to be mapped. So because they know that if these maps end up being taken to the police, well, the police will find where the gang members are. So you have a situation where you want to have an open access map to know where people are, but you also have this internal dynamic of the sort of people like the gangs or other stakeholders who do not want to be physically mapped.

So we often say from a distance, you would say, well, yes, open data is always good. We should always be able to know where everyone is. But as you talk to people who are actually in the community, as in Michael's case in Malawi or in the context of Brazil or in other contexts in general, if you want to look more into the nitty gritty of it all, there are so many dynamics going on that you wouldn't get from simply, let's say, reading a book on how maps are presented or reading a book on how technology is always good or always bad. These internal dynamics you can only get from interaction with people on the ground as opposed to just making up theories in your head. But knowing the actual ground truth or the ground dynamics adds a lot more to how more interactive and dynamic. The process of mapping itself is not just the final product but also the site of argumentation.

Tea: Is there something that we, as philosophers, can contribute to help people who live in deprived areas?

Isaac: Whenever I introduce my topic to people, they wouldn't say, "Oh wow, you're really helping the people in the slums." I say, "I try to put the conversation out there." I try to enter the dialogue, but I'm not going to go as far as to say that I'm completely, let's say, leading to any policy changes there, because the only thing I feel I can do in my little circle, my little stage, is to make the conversation as significant as possible. We need to talk about data justice, we need to talk about transparency, we need to talk about the place of bias in the training and also in the actual finalized product. When you talk about the explainability of these models, because as we're engaging in much more of these sort of transcultural or interdisciplinary way of doing ethics, way of doing philosophy, also of putting technology out there, it needs to be nuanced in this case. Geographers are also talking about these dynamics, which we talk about only in ethical circles, perhaps not as heavily as we philosophers are, but the conversation is also there. The same thing with computer scientists or data scientists, where privacy is a big buzzword now in terms of big data or AI, but it is often also a buzzword that is not, let's say, translated properly across because we need to also know what do people in communities think of privacy. Because for us to say this is what they should think about privacy, but what are they also concerned with in terms of their own stakes, in terms of their own, let's say, understanding of what privacy is. So that dialogue, I think, is getting more and more crucial as opposed to just saying we have solved all the ethical problems, just output it into the sort of papers, and that will

lead to more changes. But it's more of a dialogue that needs to be had in what exactly ethics is across the board.

Michael: I'm always surprised how often I don't think of myself as a philosopher, but then I always have to recognize that I have a philosophical training and that it shines through. But I raise questions in interdisciplinary transdisciplinary dialogues which other people seem to find strange, stimulating, or something where I feel like, yeah, this is a typical question to ask here. So, we can bring in our perspectives of our desire for clarity, our knowledge about conceptual frameworks. Think, Isaac, what you just brought up with privacy, for example, is a is a good case. Somebody throws in something like, we should uphold privacy, and the philosopher goes like, what kind of privacy? What kind of justification exactly you're building your account on? And have you considered the intercultural impact? So, I think that this is the added value that we bring in which we are good in problem reframing and framing and where we can make our good contribution.

Indeed, also our own impact will be limited. But I think it's also important to recognize that philosophy is not done by one person. I mean, that is maybe also one of the things that is misleading in the way that we still teach philosophy or history of philosophy to our students. That is all about these major figures that had this one idea, and then it changed the world. This is not how it works. And I think we can be a little bit more relaxed. So, maybe it's also important with all my energy that I put into making philosophy more empirical. I'm totally fine with armchair philosophers. We need them. Yeah, we even need more is a combination of different kinds of philosophy in order to make philosophy work nowadays. Maybe that helps a little bit for people who are a little bit hesitant and saying, "Oh, is this still philosophy what I'm doing?" Don't worry too much if you go wrong, and you do cultural studies instead. Well, hopefully you do good work and philosophy will survive. So, it's fine. Don't be too worried.

Also just good to emphasize, in view of the colleagues that we are collaborating with from remote sensing, that these people are quite clever, they're really good, and they have a good sensitivity about the conceptual issues. So, this view that engineers are just concerned about technology: forget about that. I learned a lot also about what to pay attention to and what the problem really could be in these collaborations.

Tea: Then we need to burst philosophy's superiority bubble and talk to people. Thank you very much for the conversation!