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#### Critique #4

From accessible phone applications like *i-Tree* to sonic tomography technology and ubiquitous surveillance systems, technology is redefining how we manage greenspaces. Given that mismanagement can lead to accidents and hazardous situations, technology is enhancing public safety by improving our ability to quickly and accurately identify high risk situations. The advent of technology comes with many questions: What are the implications for the future of greenspace management if a small group of entry level workers with minimal training can catalogue a whole neighborhood of trees using *i-Tree*? Will arborists only be responsible for taking sensitive data and addressing particularly tricky trees, rather than working with general populations? If AI can sift through weeks of surveillance footage within minutes, will staff cuts and ethical dilemmas ensue? While technology opens up a world of opportunity for greenspace management, our task is to adapt to our new role by remaining mindful of how to apply technology responsibly.

The scholarly paper *Assessment of urban tree condition using sonic tomography technology* is a study from Jakarta that used sonic tomography to assess tree health. The paper is open access and can be found online through the *IOP Science* website. The authors introduce the study by highlighting the need for tree assessment and the importance of “assur[ing] the entire condition of the tree” (Karlinasari). The introduction section provides a straightforward explanation of why urban trees are a desirable feature in terms of ecological services, economics, and social value. The authors express that despite these benefits, trees can also cause harm when

they are not properly assessed and managed. This assertion provides a practical application for the study's findings by tying increased risk to inadequate tree assessment.

The methods section is not overly cumbersome and it does a good job explaining how the sonic tomography system records data. The presentation of the sonic tomography data is also pretty simple, as it is merely a color gradient that represents wood health: Brown to black means the wood is solid, while violet to blue means the wood is decayed. The subsequent discussion section is full of photos and visuals which were a nice break from the somewhat denser methods section. The colorful photos of the trees in Jakarta were a welcomed addition as they are full of lush greens and warm browns. The authors also included a simple bar graph to denote the frequency of different common damages found in the assessed trees. The color gradient graphics that represent wood health were shown next to their respective trees, which helps the reader understand that visual inspections can be misleading, as some of the trees that look outwardly healthy are actually in poor internal condition.

The conclusion section conveys the need for a multifaceted approach to tree assessment, as the authors claim that no one method is sufficient. Rather, sonic tomography is a great follow up method after conducting a visual inspection, at which point even more methods may be warranted. For example, the authors note that “the routine inspection in detail should be developed not only through visual assessment but also monitoring using recommended technology to assure the entire condition of the tree” (Karlinasari). I found this paper to be a pleasant read, especially because of the colorful images and the to-the-point writing style. The authors wasted no time speculating about further research, extraneous factors, or constraints. To me, this indicated that the authors were simply trying to advocate for a greater respect and

recognition of the severity of proper tree assessment. Normally, I would be opposed to the omission of a section on constraints and limitations, however, given the simplicity of the methods and purpose of the study, I found the omissions to be appropriate.

I was also impressed by how well the authors convinced me that diversifying our tree assessment methods is key to securing public safety. I also gained a greater sense of respect for the risk that trees pose when mismanaged, which is something that I thought I had respected well enough before reading the paper. I interpreted the intention of the authors to be to establish credibility for taking tree assessment seriously and conducting assessments with as many methods as possible so as to achieve an understanding of the entire condition of each tree. The authors imply that in not doing so, there will be consequences for public safety, property value, and environmental health. Although the authors never directly stated anything about using non-intrusive methods of data collection, such as sonic tomography, before applying more intrusive methods, such as resistance drilling, I got the sense that the paper was advocating using the least harmful methods of assessment as possible. The only critique that came to mind as I read the paper was the presence of several minor grammatical errors. The errors were minor and infrequent enough that I was not bothered. They would have been a problem if they had detracted from the meaning, interpretation, and intention of the authors, however, they did not.

The article *Canton, Ohio Uses i-Tree Tools to Fulfill USFS Landscape Scale Restoration Grant* provided two major insights for me. The first important piece of information I garnered was that some cities don't have any arborists on staff: "Looking back to 2013, the Canton City Engineer was very proactive and understood the myriad benefits of the urban forest. He knew that in order to maintain and improve Canton's urban forest, it was time to hire an arborist"

(Griffith). This may seem a trivial finding, but as someone who grew up in the Twin Cities his whole life, it is very surprising to think that some cities don't have any arborists at their disposal. How are trees even assessed in those places? This point leads into the second piece of information that I took away from the article: In the age of technology, how crucial are arborists to the process of tree assessment? My thought is this: Can data be collected by volunteers or entry level workers through mobile apps like *i-Tree*, and the data analyzed by a small group of arborists? If the city engineer led the project in Canton, "the Canton City Engineer's Office worked with the City Arborist, but Engineering led the effort because they had the project management experience and technological resources (eg, with GIS) to do so" (Griffith), what role, if any, does the arborist play? To be sure, I am not recommending the dissolution of arborists and tree specialists, however, the implications of this article seem to be that the process of tree assessment might change into somewhat of a crowd-sourced labor initiative rather than the effort of a few specialists.

Aside from these two thoughts, I interpreted the purpose of the article to be to highlight the effectiveness of accessible tools like *i-Tree*: "These new trees... can be analyzed using *i-Tree* tools to monitor growth and benefits such as rainfall intercepted, carbon dioxide sequestered, and ozone removed over their lifetime. This powerful information can be used to help secure additional funding and to demonstrate the multitude of benefits trees provide to City residents" (Griffith). The authors seem to be pushing the idea that *i-Tree* is powerful enough to secure funding and generate awareness of the wide ranging benefits provided by trees. I support this conclusion and the unsubtle style in which the authors make the claim (it almost seems as if they were hired by *i-Tree* to make a testimonial). I found the article to be a thought provoking read

that challenged my perception of city staffing procedures, the future of tree assessment, and the future of accessible technology in its applications in environmental and social issues. Will *i-Tree* inspire a new wave of climate-recording applications, available for use by everyday citizens, that could produce funding and awareness? I hope so.

The NPR article *In More Cities, A Camera On Every Corner, Park And Sidewalk* details the disturbing trend of public surveillance. The article opens up with comments from local people enjoying a park in Elk Grove, a suburb of Sacramento. Some of the people aren't even aware that the park is under surveillance, while others are aware of the cameras but not of where the video is going and who is watching. I don't disagree with the utility of surveillance in catching criminals and watching over greenspaces, however, the article implied that the extent to which surveillance is being applied is unregulated and is rapidly growing out of control: "Elk Grove has invested hundreds of thousands of dollars on surveillance, and it plans to spend more" (Henn). Perhaps more concerning than the expanse of camera installations is the method with which the video is analyzed.

The Elk Grove police department uses a software to search through the footage. The software is capable of identifying different types of objects, faces, and letters, such that operators can search through hundreds of hours of footage for specific objects of interest within minutes: "Instead of watching hours, and maybe days, of video, you can ask questions like, 'Show me all red cars going east,' Or, 'Show me all red cars going east — fast.' Or, 'All red cars going east, fast, with a partial plate of A-B.'" (Henn). My main concern upon reading this is AI bias. AI programs often learn through training data which is provided by human operators. Training data can reflect the biases of the operators that produced it, for example racial, sexual, or ethnic

biases. In turn, the AI that is learning from the biased reference material will itself become biased. AI bias applies to programs like the one used by Elk Grove PD, for example, by falsely identifying minorities at a higher rate than white people.

Aside from the issue of AI bias, the article also led me to another frustrating conclusion. The Georgetown University Law professor interviewed by the author, Laura Donohue, claims that even though you might be watched in a public park, “you do have a reasonable expectation that nobody is going to be following you around 24 hours a day, seven days a week, everywhere you go” (Henn). I disagree with this claim as it omits the recognition that surveillance is expanding at an alarming rate with no foreseeable end in sight. I don’t have my tinfoil hat on yet, but it is not unreasonable to be concerned about living in a world where constant surveillance becomes the norm. I think that there is a delicate balance to be struck, one in which surveillance is not so prevalent that discrimination and privacy become concerns, yet prevalent enough that crime is deterred and greenspaces managed.

This would be a complicated balance to strike, as AI and surveillance are rapidly developing without adequate regulation. The intention of authors seems to be to rouse awareness about the scale of police surveillance and the way in which footage is analysed. I appreciate that the author took a relatively neutral stance, relying on comments from the public, police, and experts in the field, rather than his own opinions, to form the substance of the article. I was surprised to see that the article is seven years old now. It made me curious to think about how the article would be written today, and whether or not the surveillance system in Elk Grove expanded as the PD had hoped in 2013. In the context of urban greenspaces and public safety, I think that surveillance is appropriate, however, it is the context by which it is used and the

intentions with which it is used that really matter. If racists are using a racist software to track “criminals”, then surveillance is a glaring injustice. If progressive people with a vested interest in facilitating peace and cooperation are operating an unbiased software, then I think that surveillance is appropriate. Obviously there is a lot of gray area between these two extremes, and I understand that even if honest, just people are the ones behind the surveillance cameras, there are still issues about personal privacy and discrimination. I think that the best approach we can take is to ensure that surveillance footage is falling into responsible hands and that analytical software is as fair as possible. My final praise for the article is the included audio version, which although is slightly different from the main article, provides a way for sight impaired people to enjoy the article.

There is no doubt that technology is ushering in a new era of efficiency and opportunity. Data collection becomes more rapid and accurate, risks get minimized, and the human role is ever shifting away from labour. These are good things, as I believe technology is pushing us closer and closer to efficient greenspace management. The articles reviewed in this critique reflect these qualities well, however, they also reflect the need to remain aware of how we are applying technology. The sonic tomography article is a great example of how we ought to be applying technology: Responsible data collection oriented at reducing impact on the environment, producing accurate information, and using the data to reduce risk. The Canton article also reflects the better qualities of technology: Widespread, accurate data collection with simple tools. If a free mobile app can secure government funding to improve greenspace management and expansion, are there other areas, say climate justice or food security, that similar mobile apps could be used? I think so. The *NPR* article reflects technology in a different

light: If surveillance technology goes unregulated and continues to expand beyond the hope of containment, where is the stopping point? There are obvious crime reduction and prevention benefits to sophisticated surveillance systems, however, it is not so simple as giving up privacy for the benefit of risk reduction. A more meaningful discussion would be one about the software used to comb through surveillance footage. Or making sure that the public knows where the footage is going and how it is being used. In short, the *NPR* article reflects the need to make sure we remain aware of why and how technology is being used such that we address ethical issues before we allow them to become problems.

## Works Cited

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