



Q&A

Ganna Pogrebna: Rural areas are missing out on AI opportunities

The AI revolution is overlooking remote communities, but researchers can change this, says a behavioural data scientist.

The study of artificial intelligence (AI) is a relatively new field but one that is rapidly expanding. In 2015, researchers in the United States published 850 articles on artificial intelligence and robotics in journals tracked by the Nature Index; that figure had risen to 3,651 by 2021. Such rapid growth has been mirrored elsewhere, and although it might be cause for excitement, it is also good reason to be wary of biases and inconsistencies in how this research is conducted and applied.

One of these potential discrepancies is the way in which AI relates to urban and rural communities. According to Ganna Pogrebna, executive director of the Artificial Intelligence and Cyber Futures Institute at Charles Sturt University in Bathurst, New South Wales, those living in remote areas are potentially more exposed to the technology's dangers than their urban counterparts, but are being neglected by research.

How are rural communities treated differently by AI?

It starts with data collection, which is often harvested from our smart phones. Urban populations are more likely to use iPhones whereas rural populations lean towards Android. A 2021 study (D. J. Leith *In Security and Privacy in Communication Networks* (ed. J. Garcia-Alfaro *et al.*) 231–251; Springer, 2021) found that Android phones give Google 20 times more data than iPhones send to Apple. Android phones dominate in more rural countries such as those in Africa where 87.22% of the population use Android phones.

More data are therefore harvested from rural populations than urban ones. That's the first half of this issue.

What are the consequences of this inequality in data gathering? Doesn't it benefit rural areas?

When technology is created off the back of those data, it ends up benefiting urban populations and so you have a situation where rural data are being used to enrich urban lives — that's the second half of this issue. For example, a 2019 study (J. Guerra *et al.* *PLoS ONE* **14**, e0215278; 2019) found that public-health AI projects primarily use community-based surveillance data collected from rural areas, but the studies that use these data are informing public-health policies in urban areas.

Facial recognition is another noteworthy example. A lot of the data used to make facial recognition possible are generated from rural environments, but the technology is primarily used in metropolitan areas. Cities in some countries are trialling 'pay with your face' schemes in their public transport networks, which recognize a traveller's face and track their journey from start to finish before charging their credit card. Cities in China are meanwhile using facial recognition to help with COVID-19 contact tracing. So rural data are being used in urban settings and that's not necessarily reciprocated.

How would AI improve rural communities if they were able to better access the technology?

Rural communities are largely missing out on the benefits of data-driven research and that's a big shame because AI has the potential to improve country life. I'm based in rural Australia where we often face flooding and forest fires; there are projects going on at the moment that seek to use AI to advance disaster management in remote communities. Algorithms are mining social-media posts to learn from the language being used and the pictures being shared to deduce whether flooding is happening and to what extent. This can then be used to predict which areas might be flooded next and how badly. It can give us several hours' head-start in rural areas where resources are stretched.

Are you optimistic that this AI regional-urban gap will ever be closed? What can be

done to solve or improve the situation?

I'm optimistic that things will improve. Farmers and local businesses see that AI has the potential to ensure their products reach where they're most needed. We need to look at the reasons why AI projects tend to be rolled out in cities, and not in the country.

First, it's about digital infrastructure. As soon as you leave Sydney and go just a few miles into the mountains, you lose mobile-phone reception. People are talking about 5G and 6G connections in some parts of the world, but frankly, you're lucky if you have 3G in the countryside here and Australia isn't alone with this disparity. A 2018 survey carried out by the Pew Research Center found that almost 25% of adults who live in rural parts of the United States said access to high-speed Internet was a major problem for them, compared with just 13% of adults in urban areas and 9% in suburban districts. Rural communities are missing out on AI for infrastructural reasons that aren't within their control. That needs to change.

Second, it can be a challenge to recruit talent to come to these areas and work on AI. I work from the Bathurst campus of Charles Sturt University, which is a three-hour drive inland from Sydney, and it's difficult to find people who are willing to move to the country. I don't want this to turn into an advertisement for our institution, but I do think it would be good if more AI researchers worked in rural areas like Bathurst because it helps you as a researcher to better understand the challenges of living in a rural area. Having more institutes in rural areas also helps with education; if more AI experts are here it means we can help to increase the local community's understanding of the benefits of AI.

I'm optimistic, but closing the gap will require work from local communities, researchers and government.

Interview by Benjamin Plackett

This interview has been edited for clarity and length.