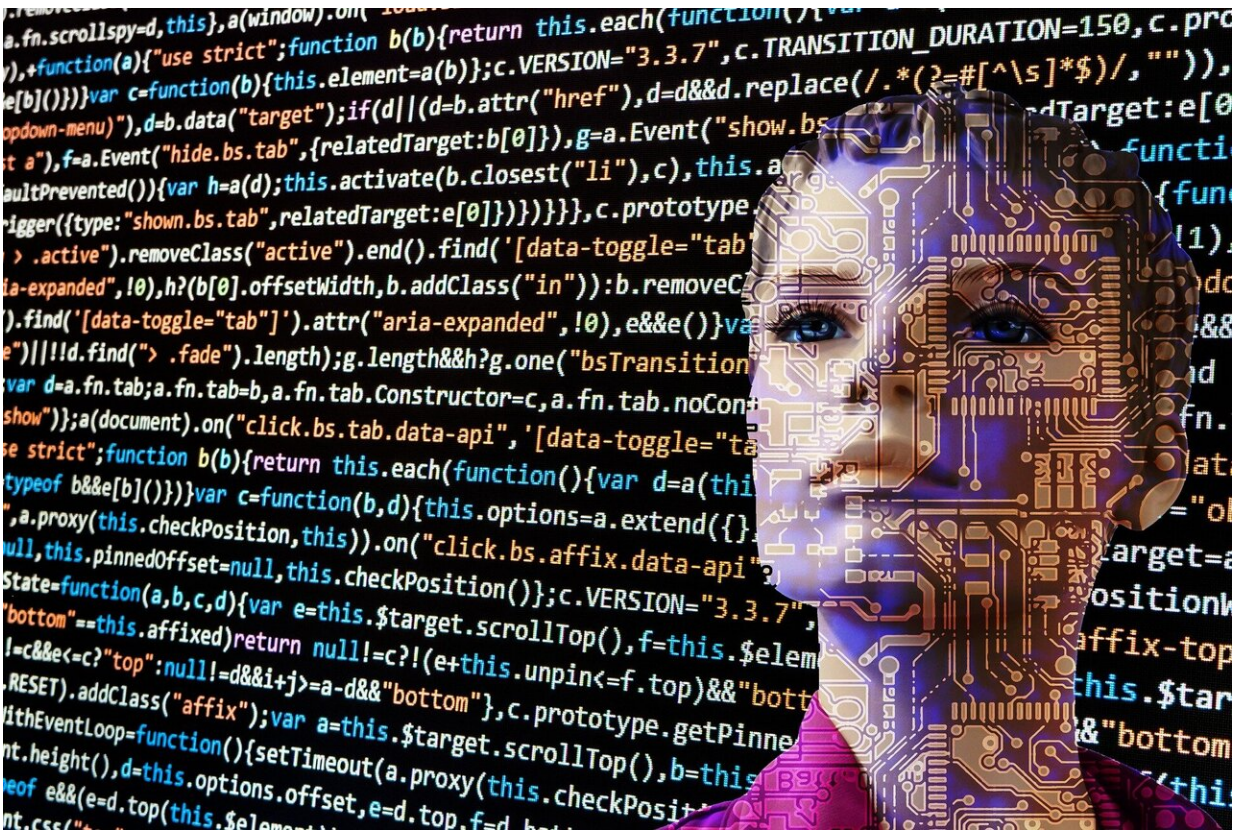


# Using AI to remove racial disparity in knee pain diagnosis

January 27 2021, by Bob Yirka



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A team of researchers affiliated with several institutions in the U.S. has developed an artificial-intelligence-based application for categorizing the degree of pain in patients suffering from osteoarthritis in their knees. In

their paper published in the journal *Nature Medicine*, the group describes using a new AI training approach and what their results showed about racial bias in patient diagnoses. Said Ibrahim with Weill Cornell Medicine has published a News & Views piece outlining the work by the team in the same journal issue.

Prior research has shown that minorities in the U.S. (most particularly Black people) tend to receive lower-quality health care than white people. Research has also shown that physicians tend to believe [minority patients](#) exaggerate their conditions and the degree of the problems they experience. They are also quite often judged to be exaggerating the degree of pain they feel from conditions such as knee osteoarthritis. As the researchers note, the result is that minorities are less likely to have artificial knee replacements, the optimal pain-reduction strategy when treating knee osteoarthritis.

Artificial intelligence has been used in a wide variety of medical applications, mostly to help spot cancer or other problems in [human tissue](#). Typically, such AI systems are trained by using doctor assessments of the condition under study. But, as the researchers note, that approach introduces human bias to the results that are produced by such systems. In this new effort, the researchers took a different approach—they trained their system using both X-rays and descriptions of the condition by the patients themselves, including their own assessment of their pain levels.

The researchers then used their AI system to diagnose human volunteer [osteoarthritis](#) patients and compared what they found with opinions given by doctors. In so doing, they found that the AI system outperformed the doctors in all patients, and particularly so in [minority patients](#).

The researchers suggest their results prove bias in diagnosing minority

patients and also provide a path for correcting the problem. AI systems, they contend, can serve as tools to fill in blind spots caused by inherent human bias based on the skin color of patients.

**More information:** Emma Pierson et al. An algorithmic approach to reducing unexplained pain disparities in underserved populations, *Nature Medicine* (2021). [DOI: 10.1038/s41591-020-01192-7](https://doi.org/10.1038/s41591-020-01192-7)

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