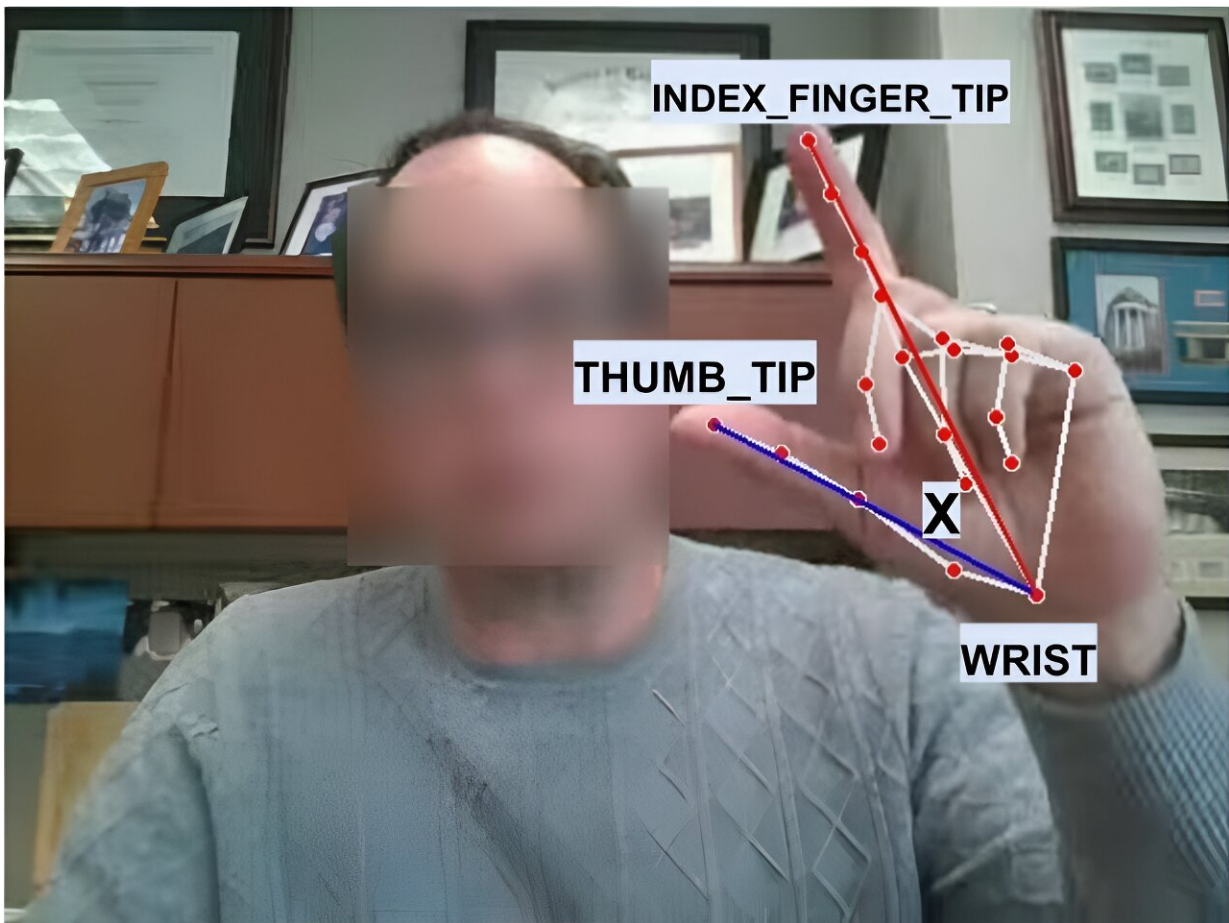# Online AI-based test for Parkinson's disease severity shows promising results

September 7 2023, by Luke Auburn

All the extracted key-points are displayed as red dots. The three key-points WRIST, THUMB_TIP, and INDEX_FINGER_TIP were used to compute the finger-tapping angle X. Credit: University of Rochester / Saiful et. al.

An artificial intelligence tool developed by researchers at the University of Rochester can help people with Parkinson's disease remotely assess the severity of their symptoms within minutes. A study in *npj Digital Medicine* describes the new tool, which has users tap their fingers 10 times in front of a webcam to assess motor performance on a scale of 0–4.

Doctors often have patients perform simple motor tasks to assess movement disorders and rate the severity using guidelines such as the Movement Disorder Society Unified Parkinson's Disease Rating Scale (MDS-UPDRS). The AI model provides a rapid assessment using the MDS-UPDRS guidelines, automatically generating computational metrics such as speed, amplitude, frequency, and period that are interpretable, standardized, repeatable, and consistent with medical guidebooks. It uses those attributes to classify the severity of tremors.

The finger-tapping task was performed by 250 global participants with Parkinson's disease and the AI system's ratings were compared with those by three neurologists and three primary care physicians. While expert neurologists performed slightly better than the AI model, the AI model outperformed the primary care physicians with UPDRS certification.

"These findings could have huge implications for patients who have difficulty gaining access to neurologists, getting appointments, and traveling to the hospital," says Ehsan Hoque, an associate professor in Rochester's Department of Computer Science and co-director of the Rochester Human-Computer Interaction Laboratory. "It's an example of how AI is being gradually introduced into health care to serve people outside of the clinic and improve health equity and access."

The study was led by Md. Saiful Islam, a Google Ph.D. fellow and a graduate student in computer science advised by Hoque. The team of

computer scientists collaborated with several members of the Medical Center's Department of Neurology, including associate professor Jamie Adams; Ray Dorsey, the David M. Levy Professor of Neurology; and associate professor Ruth Schneider.

The researchers say their method can be applied to other motor tasks, which opens the door to evaluating other types of movement disorders such as ataxia and Huntington's disease. The new Parkinson's disease assessment is available online, though the researchers caution that it reflects an emerging technology and at this early stage should not be considered, on its own and without a physician's input, as a definitive measure of the presence or severity of the disease.

More information: Md Saiful Islam et al, Using AI to measure Parkinson's disease severity at home, *npj Digital Medicine* (2023). DOI: 10.1038/s41746-023-00905-9

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