Researchers develop smartphone app that reliably recognizes physical signs of stroke

August 2 2023

Credit: Pixabay/CC0 Public Domain

Today at the Society of NeuroInterventional Surgery's (SNIS) 20th Annual Meeting, researchers discussed a smartphone app created that reliably recognizes patients' physical signs of stroke with the power of

machine learning.

In the study, "Smartphone-Enabled Machine Learning Algorithms for Autonomous Stroke Detection," researchers from the UCLA David Geffen School of Medicine and multiple medical institutions in Bulgaria used data from 240 patients with stroke at four metropolitan stroke centers. Within 72 hours of the start of the patients' symptoms, researchers used smartphones to record videos of patients and test their arm strength in order to detect patients' facial asymmetry, arm weakness, and speech changes—all classic stroke signs.

To evaluate facial asymmetry, the study authors used machine learning to analyze 68 facial landmark points. To test arm weakness, the team used data from a smartphone's standard internal 3D accelerometer, gyroscope, and magnetometer. To determine speech changes, researchers used mel-frequency cepstral coefficients, a typical sound recognition method that translates sound waves into images, to compare normal and slurred speech patterns. They then tested the app using neurologists' reports and brain scan data, finding that the app was sensitive and specific enough to diagnose stroke accurately in nearly all cases.

"It's exciting to think how this app and the emerging technology of machine learning will help more patients identify stroke symptoms upon onset," said Dr. Radoslav Raychev, a vascular and interventional neurologist from UCLA's David Geffen School of Medicine. "Quickly and accurately assessing symptoms is imperative to ensure that people with stroke survive and regain independence. We hope the deployment of this app changes lives and the field of stroke care."

Provided by Society of NeuroInterventional Surgery