

POWERING NEW IMPACTS FOR HEALTHCARE WITH ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

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Australian
National
University



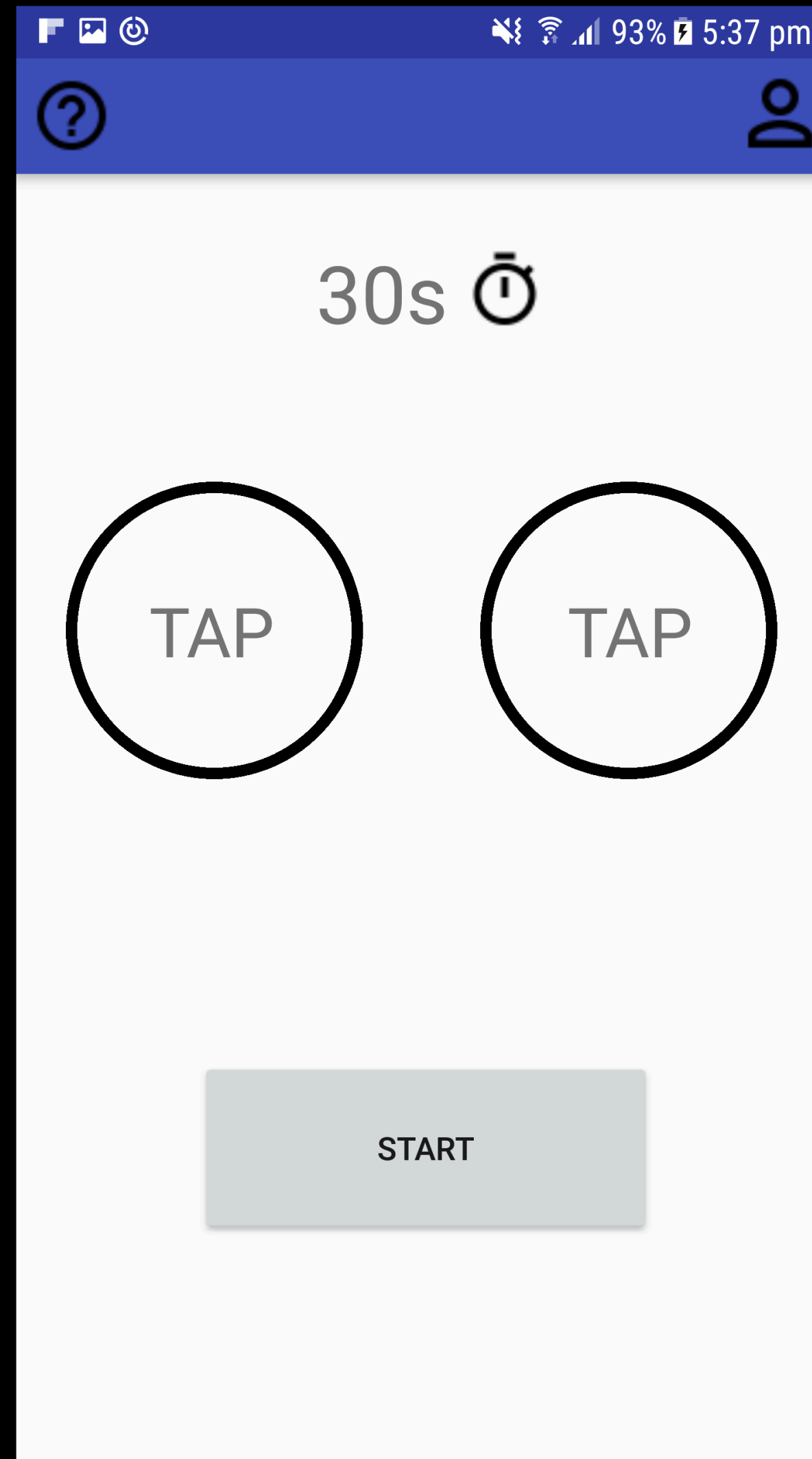
Our Health in Our Hands

**Personalised medical technologies for sustainable and
effective healthcare**

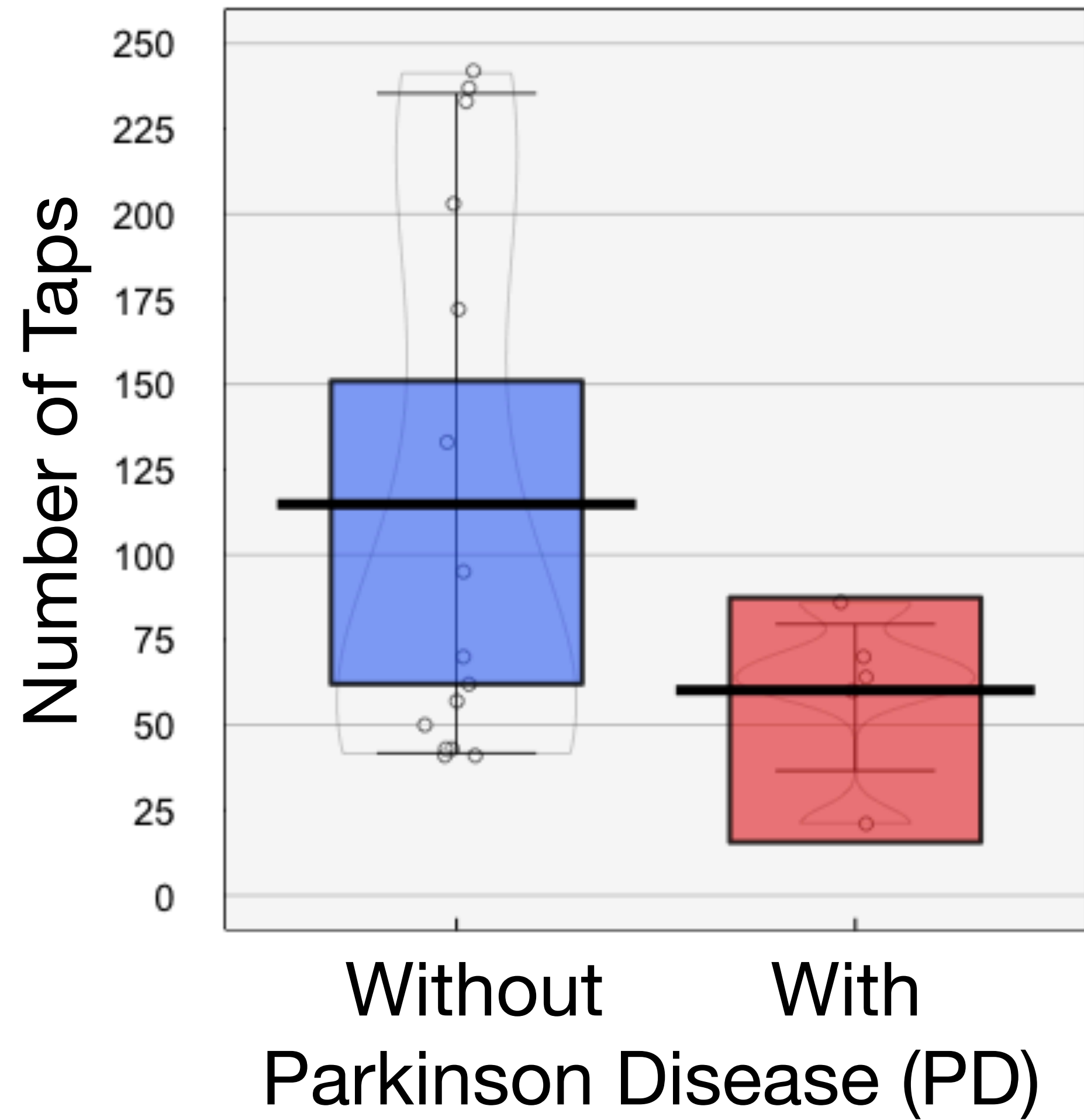
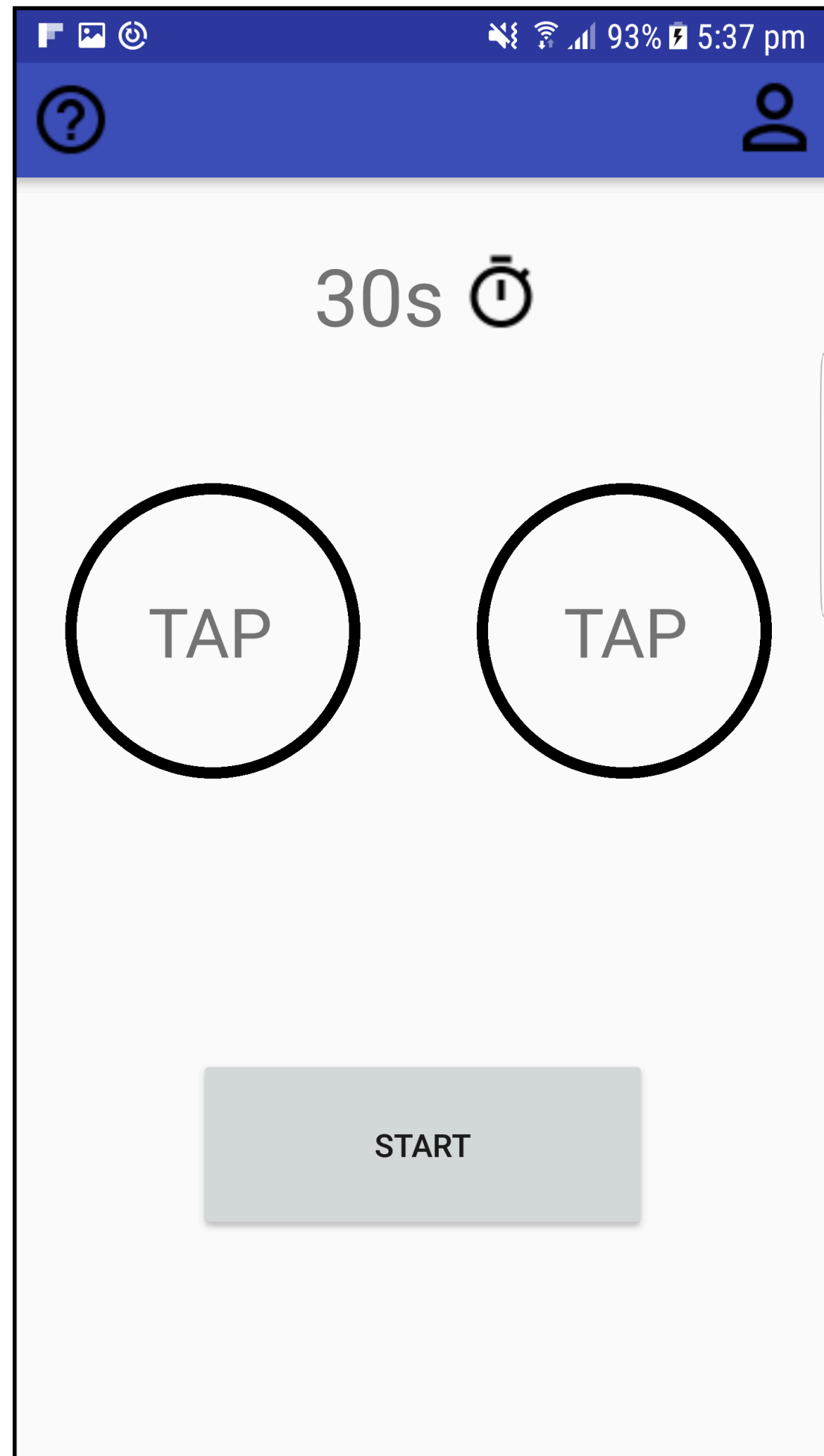
A satellite night view of Australia, showing the continent's outline and numerous city lights glowing against the dark landmass. The surrounding oceans are dark blue, and the horizon of the Earth is visible at the top of the frame.

**Australian National University
2017 Grand Challenge**

Tap



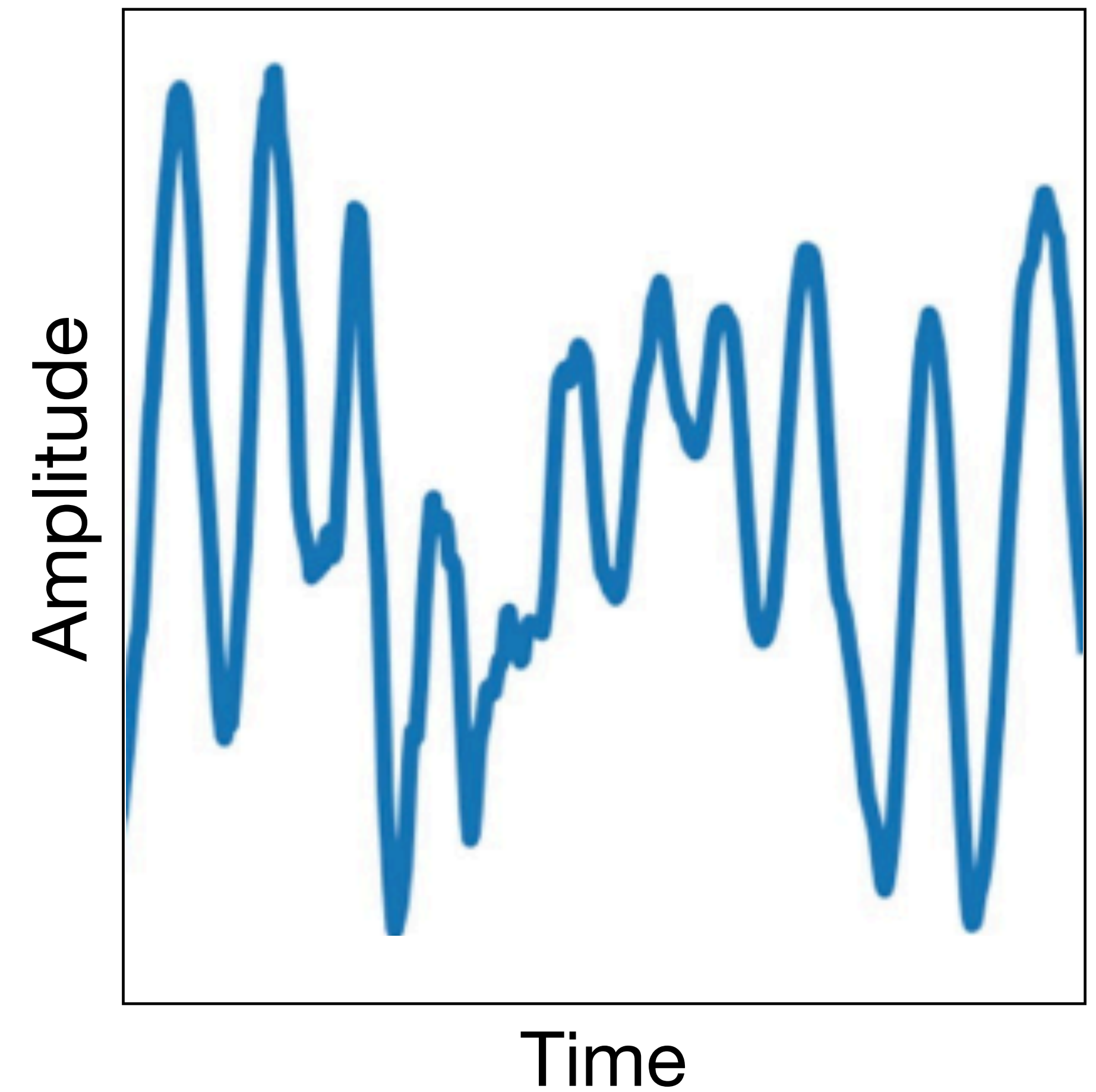
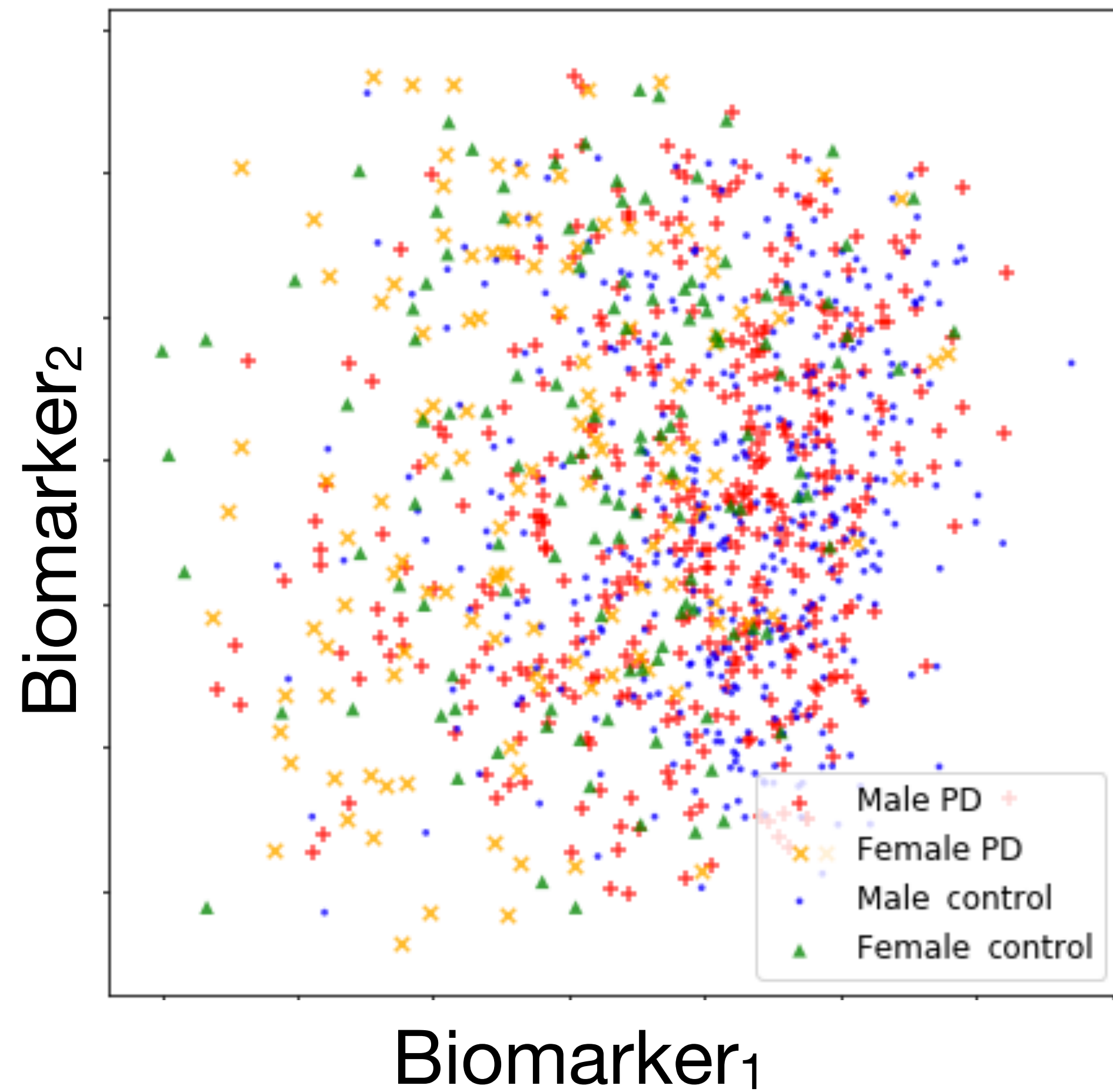
Music from Uppbeat (free for Creators!):
<https://uppbeat.io/t/kevin-macleod/comparsa>
License code: QSJHNGOTDXKMILFR



Suominen H, Manocha M, Desborough J, Parkinson A, Apthorp D (2021). Finger tapping measures for Parkinson's disease: Preliminary evaluation of an Android application for data collection in Australia. ***Studies in Health Technology and Informatics***.

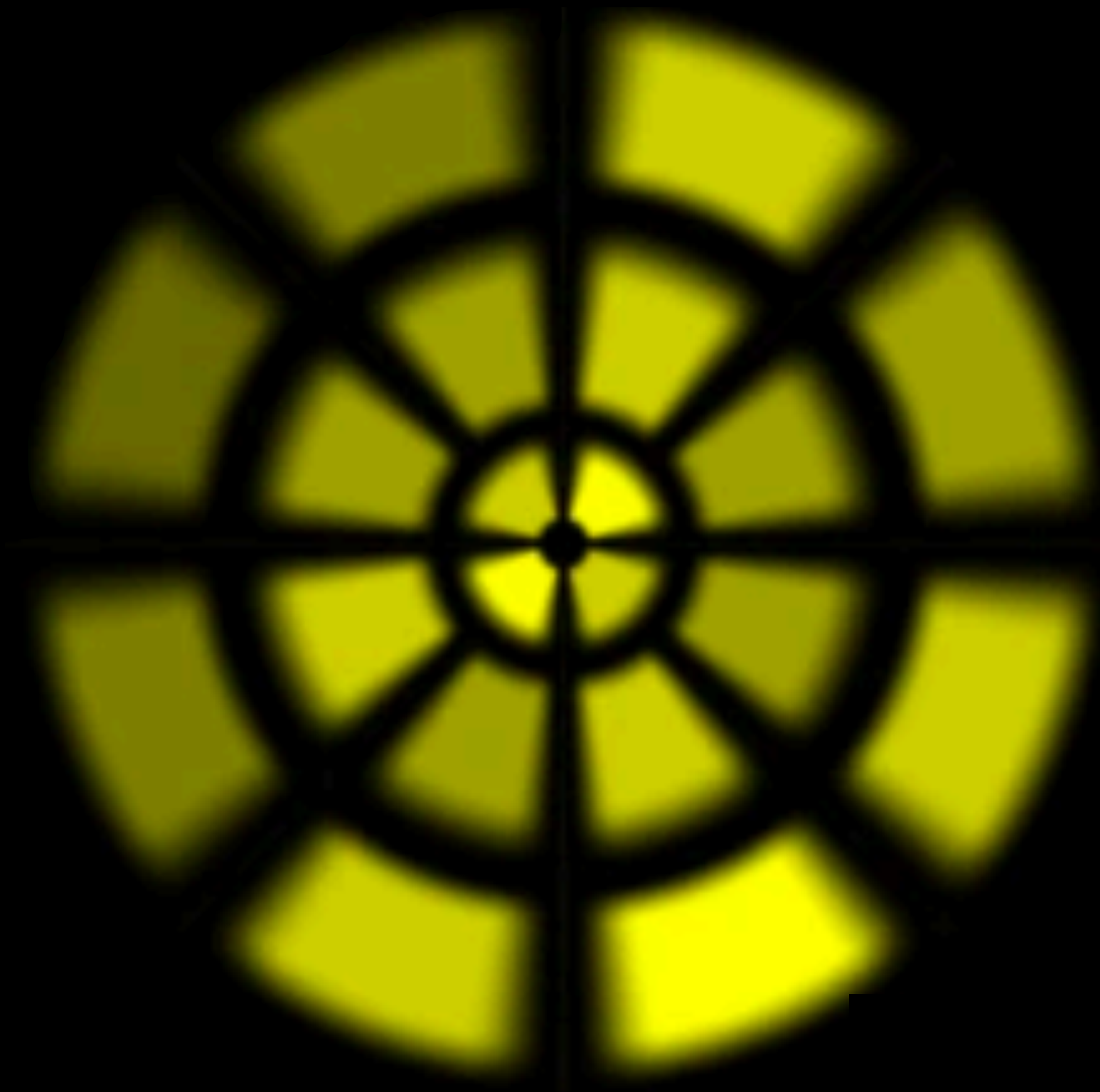
Say “aaaaah”

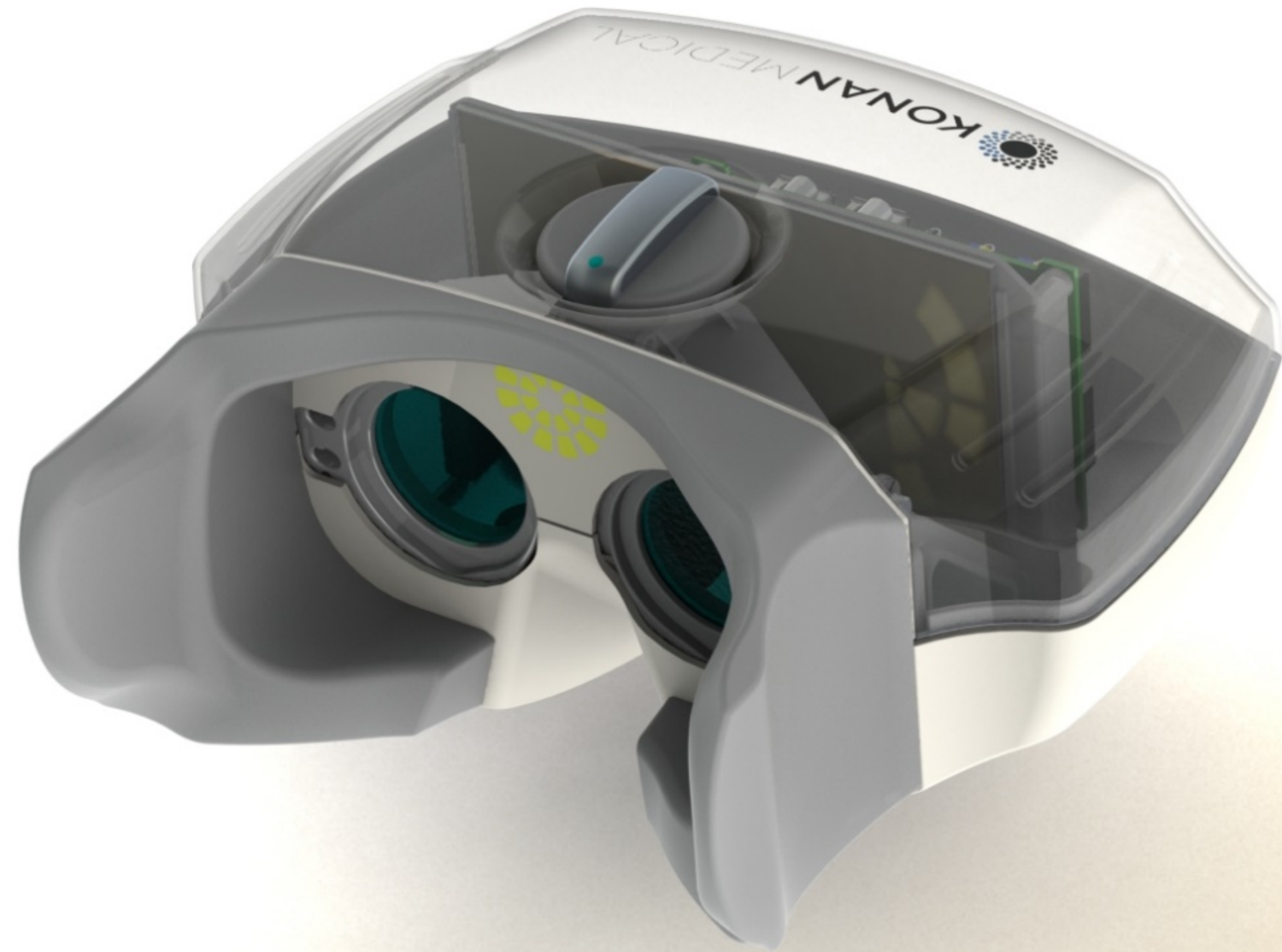




Wang M, Ge W, Apthorp D, Suominen H (2020). Robust feature engineering for Parkinson disease diagnosis: New machine learning techniques. ***JMIR Biomedical Engineering***.

Take a visual field test by look into the distance



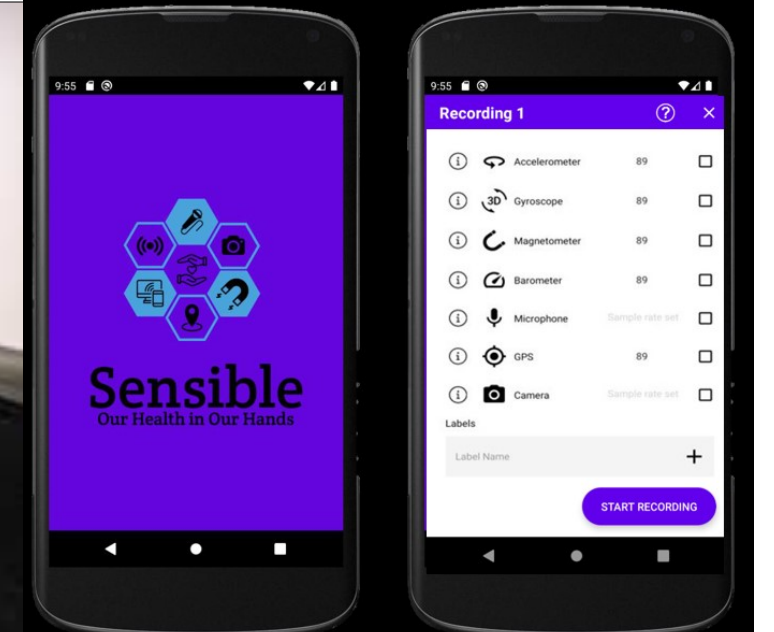
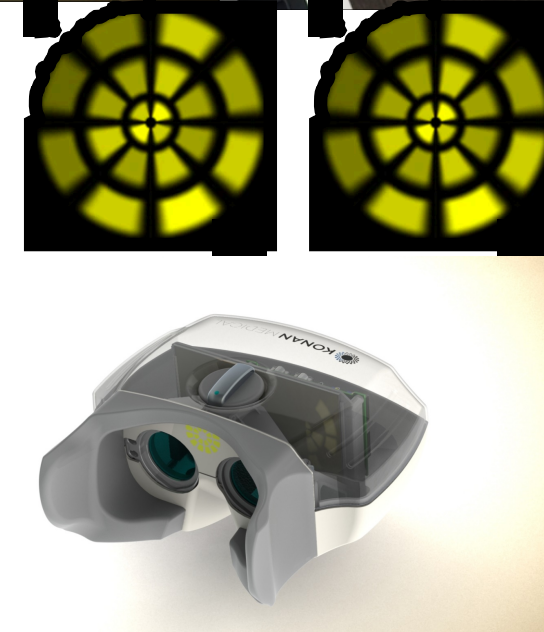
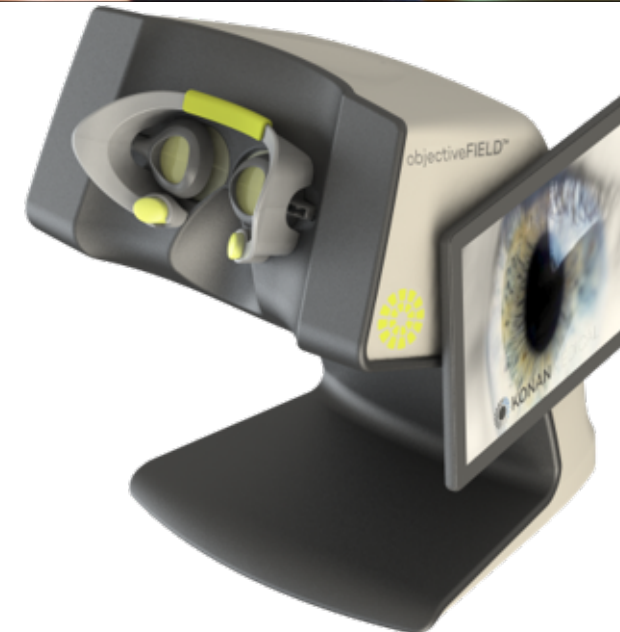
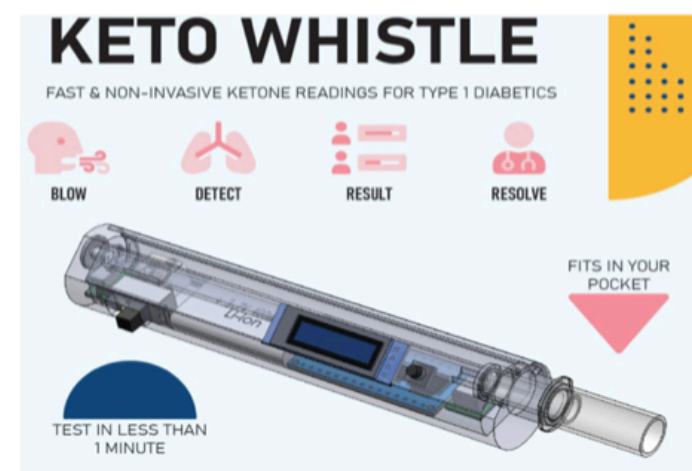
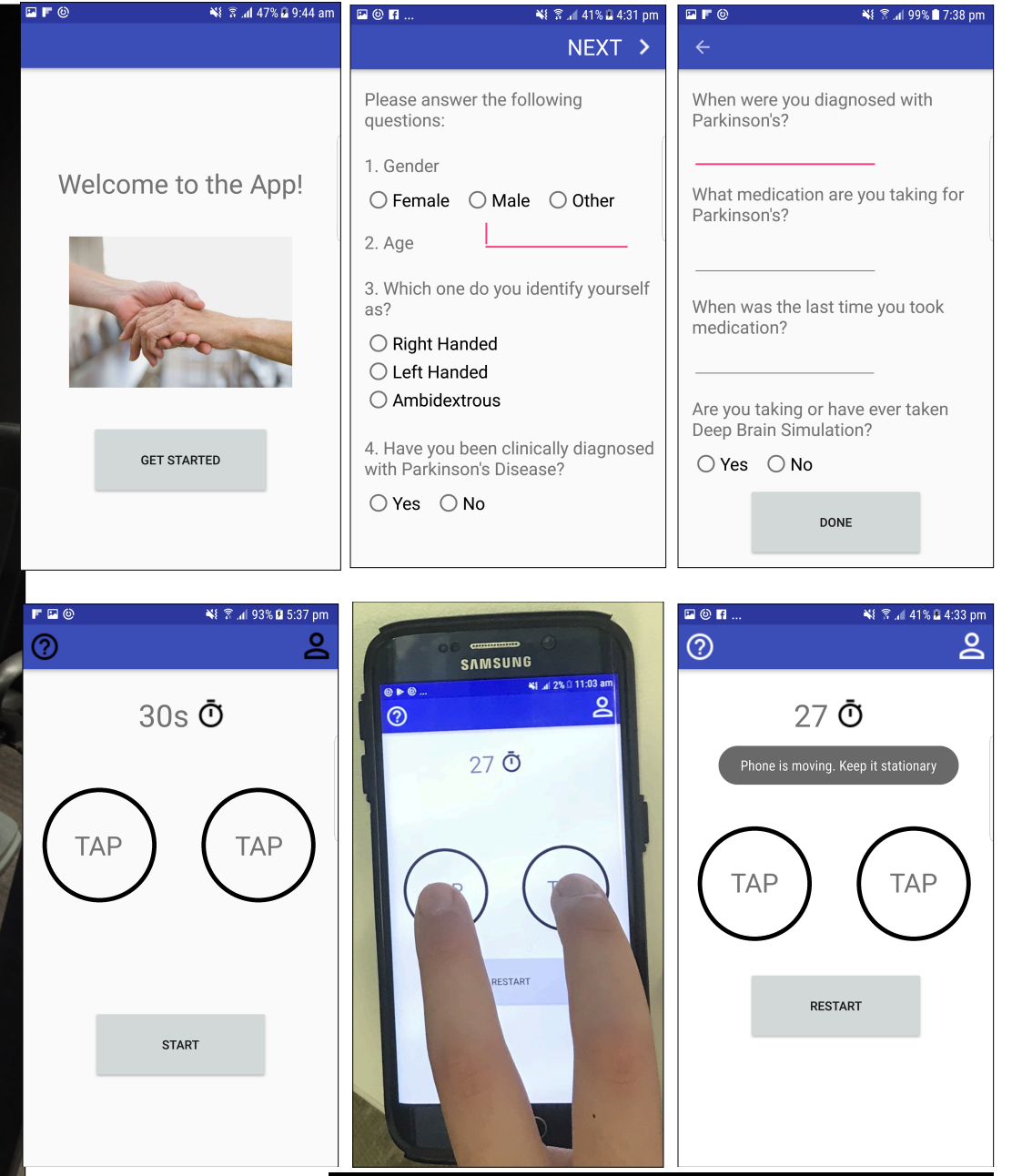


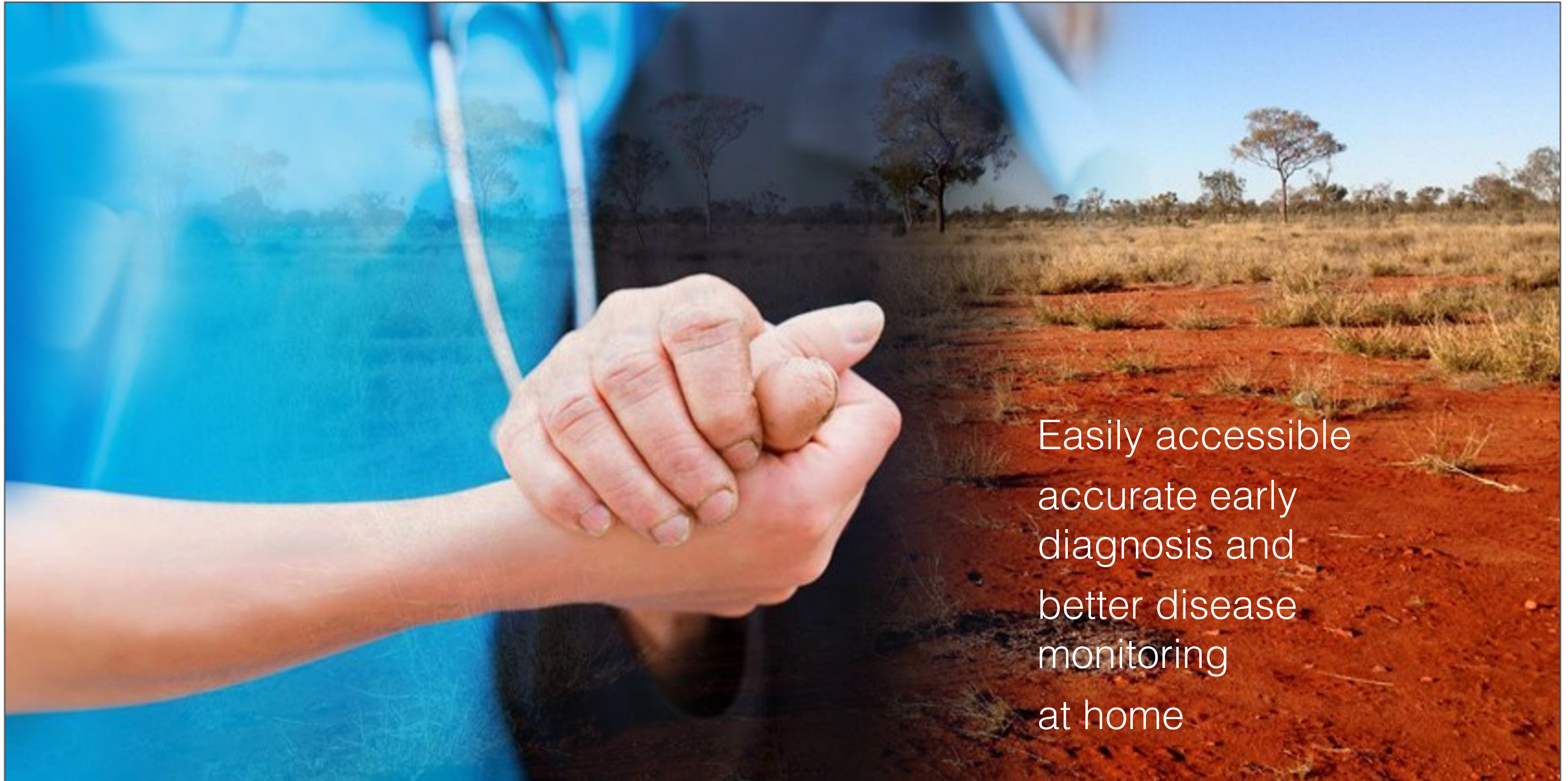
Maddess T, van Kleef JP, Rohan EMF, Carle CS, Baird-Gunning J, Rai BB, Bruestle A, Lane J, Lueck CJ (2022). Rapid, non-contact multifocal visual assessment in multiple sclerosis. ***Neurological Sciences***.

Smart Sensing and Sense-Making

Voice

Reduced Volume
Monotonous Speech
Imprecise Articulation
Slurred Speech
Hesitant Speech





Easily accessible
accurate early
diagnosis and
better disease
monitoring
at home

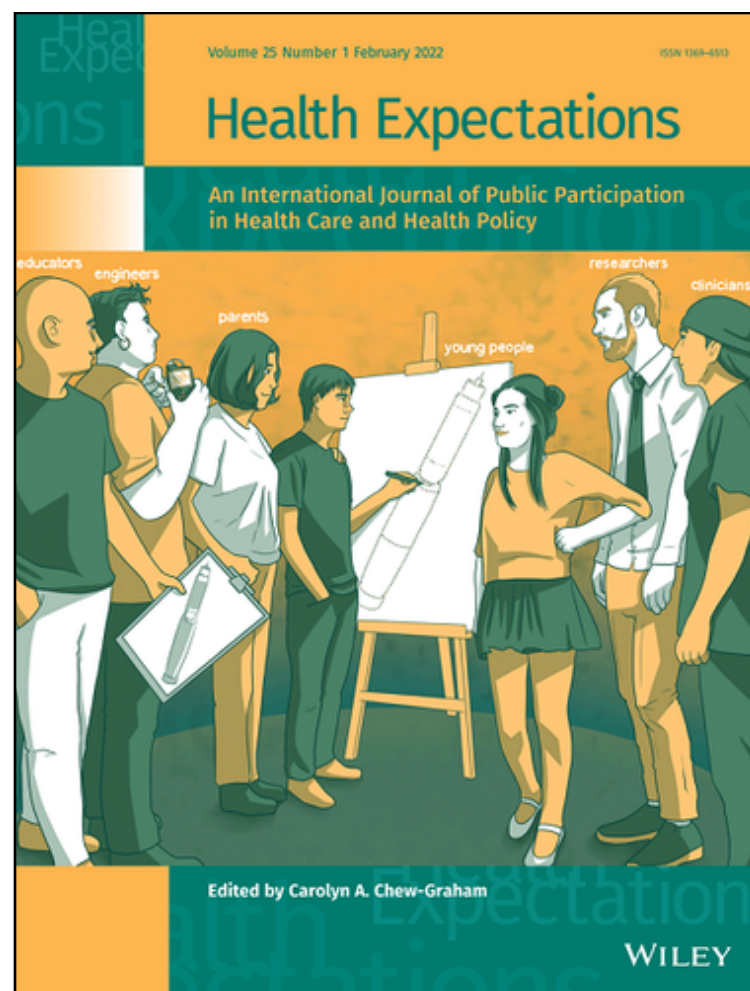
Image from: <https://www.ruralhealth.org.au/>

Goals

1. Identify disease subtypes, predict therapeutic responses, and improve the accuracy and reliability of prognosis
2. Improve disease monitoring and patient outcomes
3. Build trustworthiness into this system
4. Prepare the way forward for research translation



Co-creation Matters



Henschke A, Desborough J, Parkinson A, Brunoro C, Fanning V, Lueck C, Brew-Sam N, Brüstle A, Drew J, Chisholm K, Elisha M, Suominen H, Tricoli A, Phillips C, Cook M (2021). Personalizing medicine and technologies to address the experiences and needs of people with multiple sclerosis. ***Journal of Personalized Medicine***.

Thank you for giving us hope

MS Symposium 2020

*Before we live what's next,
it always seems like there is
some answer we need to arrive at.
But daring to enter,
we are humbled to
discover, again and again, that
the act of living itself unravels
both the answer and the question.*

Dr Mark Nepo

