Multimodal Platform for early Parkinson's Disease detection

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Experience: Dr. Chin-Hsien Lin is a neurologist at National Taiwan University Hospital (NTUH). Her clinical and research work focuses on Parkinson's disease (PD). Dr. Lin is actively advancing novel biomarkers and integrated, multimodal biosensing platforms aimed at the early detection of PD. By integrating diverse biosignature data, Dr. Lin's group has developed an artificial intelligence platform capable of detecting PD.

Market Needs: With the global population aging, PD is a common neurodegenerative disorder with clinical features of motor dysfunction, such as bradykinesia, rigidity, and gait instability. Early detection and timely intervention are crucial for improving therapeutic outcomes.

Our Technology: Dr. Lin's team has developed an artificial intelligence–driven platform that integrates multimodal features, including speech, hand movements, and gait, to detect PD. The integrated model was trained on data from more than 500 participants. The system achieved an accuracy of 86% in individuals with subjective symptoms and 82% in those without. It also demonstrated cross-cultural generalizability, reaching 87% accuracy in identifying PD among elderly participants in a Korean cohort. The system has been optimized into a cross-platform mobile application, "Parkinson Application," available for both iOS and Android devices. Using only a smartphone or tablet, users can record speech and movement data for real-time analysis, condensing what traditionally required specialist evaluation into a process completed within 15 minutes. This innovation helps mitigate healthcare workforce shortages and geographic barriers, facilitating early disease intervention and precision care.

Strength: This technology integrates multimodal features with AI deep learning to accurately detect early signs of PD (up to 87% accuracy). It has been further optimized into a cross-platform Parkinson App that enables rapid remote analysis within 15 minutes, offering strong clinical accessibility. Validated across multiple institutions, it enhances large-scale screening and early diagnosis efficiency in aging populations and remote communities.

Competing Products: mPower (Sage Bionetworks, apple), PKG watch (Global Kinetics)

Intellectual Properties:

(1) This technology is not yet patented and is currently under evaluation for patent application.

(2) Combining medical and information technology expertise, our team builds on NTU's strengths in intelligent speech modeling and NTU Hospital's large cohorts of elderly individuals and Parkinson's disease patients. Through long-term interdisciplinary collaboration, we identified key clinical unmet needs and developed a practical, user-friendly smart healthcare solution to enable early diagnosis and intervention—even before symptoms appear. This technology also addresses challenges of aging and rural healthcare shortages, with established processes for data reliability, model design, training, and cross-institutional validation.

Contact (do not need to fill out):

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