PRESS RELEASE

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SMK Corporation
National Cerebral and Cardiovascular Center

SMK and NCVC launch joint research and development of speech-based algorithm to support the diagnosis of dementia using speech in Japanese based on the technology of Canary Speech

SMK Corporation（President, CEO and COO: Yasumitsu Ikeda, hereinafter referred to as SMK）and National Cerebral and Cardiovascular Center (President: Kinya Otsu, hereinafter referred to as NCVC) have launched joint research and development for creating algorithm to support the diagnosis of dementia using speech in Japanese based on the technology of Canary Speech, Inc. (CEO and Co-Founder: Henry O'Connell, hereinafter referred to as Canary Speech) .

The AI algorithm to be developed in this research enables analysis of cognitive declines using 30 seconds audio data of free speech in Japanese, contributing to early screening of dementia. Development will be completed by the summer of 2022 and supposed to be commercialized within 2023 fiscal year. Target applications include medical diagnosis support tools, screening for dementia insurance enrollment and use at health checkup institutions (e.g. health screening). We aim to obtain certification for the medical device program in the future.

In order to develop the algorithm, it is necessary to have the AI learn from the voice recordings of subjects with actual cognitive decline and the results of cognitive function tests as "example" and "correct answer" data (these are generally referred to as "training data"). Anonymized voice data obtained from subjects aged 71 years or older who participated in the "New era healthcare infrastructure development project" in Nobeoka city, Miyazaki prefecture, and who underwent telephone cognitive function screening, and from inpatients and outpatients (aged 20 years or older) with suspected cognitive dysfunction who obtained individual consent on a consent form at the department of neurology and cerebrovascular, NCVC, will be accumulated and used at NCVC. Based on this data, the AI algorithm will be developed jointly by NCVC, and SMK, Canary Speech in U.S., a business partner of SMK.

SMK

国立研究開発法人
国立循環器病研究センター

<Current status and problems of dementia>

The number of dementia patients in Japan continues to increase as the population ages, and it is estimated that the number of patients will exceed 7 million by 2025 (according to a survey by Ministry of Health, Labor and Welfare in 2015). Dementia is caused by the accumulation of amyloid-β and tau. The accumulation of these substances starts 10-20 years before the onset of the disease, and the disease develops through the mild cognitive impairment stage, so early detection is important to prevent progression.

Accurate diagnosis of dementia requires medical professionals with specialized knowledge and experience, 15-30 minutes of neuropsychological testing per case, and expensive imaging and other detailed examinations, placing an enormous burden on both medical professionals and patients. In some cases, elderly people have difficulty in communicating their symptoms. To solve these problems, there is a need for an inexpensive, simple, and automatic diagnostic tool that can detect the early stages of dementia without neuropsychological tests.

<Features of speech-based algorithm for dementia diagnosis support>

- AI-based deep learning is used to analyze the voice features of each disease.
- In addition to dementia, depression and fatigue can also be analyzed as secondary factors.
- Since analysis is possible as long as there is a microphone and an environment that can be connected to the cloud, it can be used with a variety of devices such as PCs, smartphones, and AI speakers.

<Roles of each company>

Name of company/organization	Role
SMK Corporation Headquarters: Shinagawa, Tokyo General electronic components manufacturer	Joint research and development, distribution after development
National Cerebral and Cardiovascular Center Location: Suita city, Osaka National advanced medical research center	Join research and development, data collection
Canary Speech, Inc. Headquarters: Utah, U.S. Founded in 2015. A startup developing technology to analyze diseases and a person's condition through speech.	Development of algorithm

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