Support for Startup Ecosystem Formation

Greater Tokyo Innovation Ecosystem

Adoption year：FY 2022　　Principal Investigator：KEIO University / Keio University / Taishiro Kishimoto　　（As of Aug.2022）

Subject of Research　Dementia Detection Technology Based on Acoustic Analysis: Business Testing

Overview

We have developed a machine learning model that uses acoustic features to identify the possibility of dementia or mild cognitive impairment from approximately two minutes of free conversation. We have applied for a patent for this technology. In this project, conversation data between financial institution employees and elderly customers will be collected to refine this technology. Furthermore, we will study how to operate this technology in actual business situations and its price.
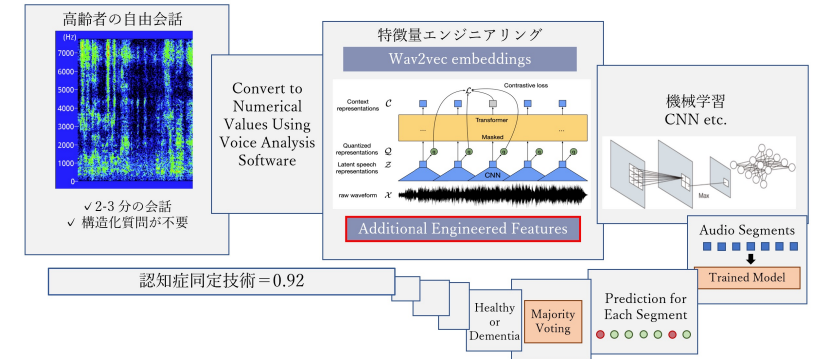
Business Models（when applying）

In Japan, the initial target will be financial institutions with elderly customers. The service will measure cognitive status based on free conversation at sales and customer service sites. Currently, when a financial institution enters into a contract with an elderly customer, each sales representative has to determine, based on his/her own experience and knowledge, whether the elderly customer has the cognitive function to understand the contents and risks involved. In addition, they restrict sales of high-risk products to customers 85 years of age or older in accordance with industry guidelines. In response to this situation, we will provide technology that can determine whether or not cognitive function has declined, and provide appropriate services according to the cognitive function of elderly customers.

Activity Planning（when applying）

Conversation data of approximately 5 minutes will be collected from a target of 300 elderly persons who seek deposit/trust transactions and testamentary trust services at financial institutions, and will be linked to the the Revised Hasegawa's Dementia Scale（HDS-R）results obtained by the bank.Using this data, an optimal machine learning algorithm will be created to estimate HDS-R scores.In addition, we will prepare for productization in the sales scene.

（ Applying the results of the past year ）
Classification performance
MMSE ≥27/≤26

	F1	Sensitivity	Specificity	Precision
平均	0.808	0.815	0.707	0.817
標準偏差	0.036	0.094	0.171	0.082

- 20-fold random cross-validation (ratio of train and test = 70:30)
- Assessments for the same patient are in the same dataset
- F1 scores calculated for the predictions by majority voting