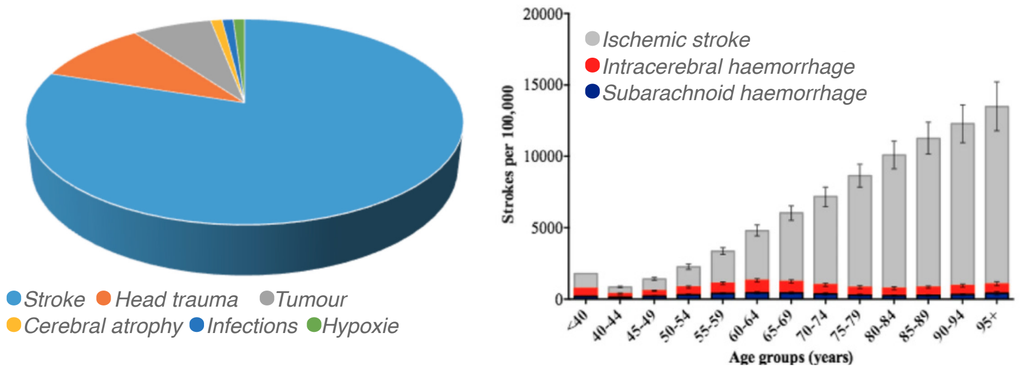
APH-ALARM

www.aph-alarm-project.com

...a new chance for communication

Introduction

Aphasia describes the lack of the already gained ability to use language in a common way. “Language” in case of Aphasia covers all variations of forming or understanding messages. So the negative effects of Aphasia are not limited to the spoken word. Reading and writing could be affected as well as the ability to extract the meaning of a received message (natural language understanding).



(left) causes of aphasia [1]; (right) stroke prevalence [2]

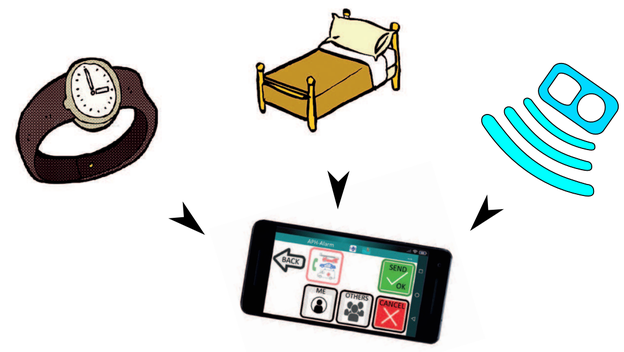
Beside some other, less relevant, causes, strokes are known as the most common trigger for Aphasia. As the risk of strokes increases with the persons' age, the most affected group are people 55+. As this group is often not familiar with modern technologies like smartphones, special simple-to-use-solutions are required.

R&D Aim and Methods:

APH-Alarm R&D's aim is to provide alternative communication possibilities, through gesture detection, pictogram arrangements and automatic situation assessment (e.g. fall detection).

Alternative communication options (left to right): tapping, stomping, waving, pictogram based

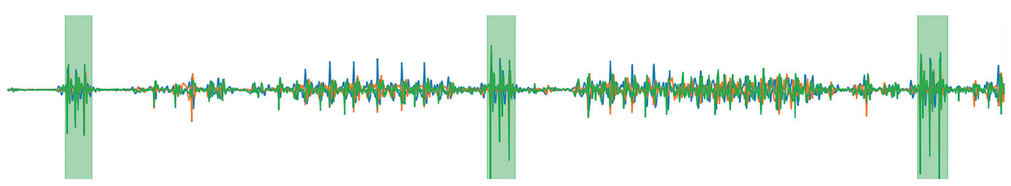
Another main goal is to provide a full-time available solution, suitable for indoor and outdoor usage. To cover those needs, APH-Alarm focuses on two basic usecases: (A) daytime support through smartphone, (B) nighttime support through wearables and room mounted sensors.



Sensor usage options (left to right): wearables (i.e. smart-watches), bed mounted sensors (acceleration sensors), room mounted sensors (Radar)

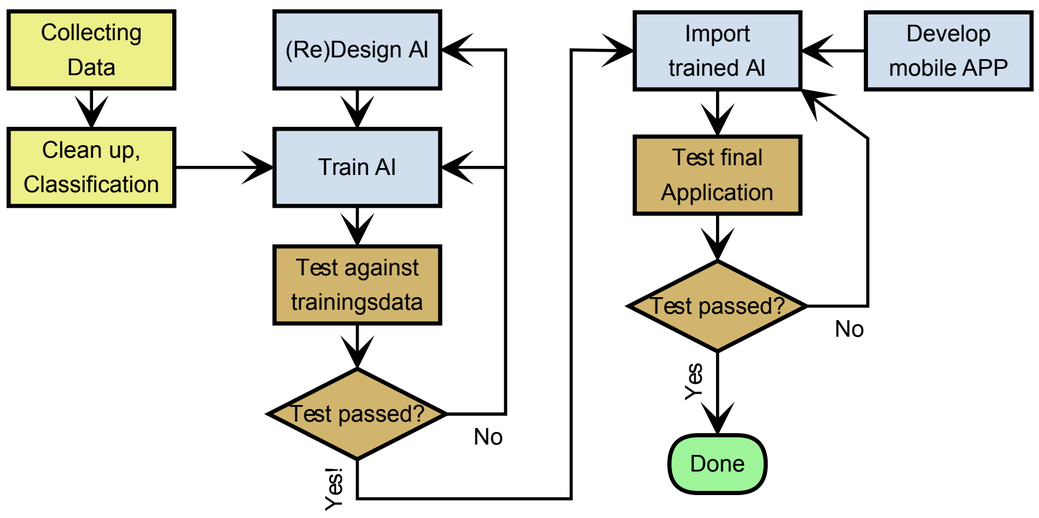
Technical Implementation

Regardless of which sensor is in use in the background, a trained AI is evaluating the received sensor data (i.e. acceleration, rotation, pressure, …) and triggers the corresponding events.
For data collection an additional application was created to sample real life data from various persons and situations.



Motion raw data with detected events marked (green highlighting)

Project research focuses on the design and training of the AI, while the product development steps are needed to integrate the trained AI into the mobile device application.



Resources:

[1] aphasiker.de (2019)
[2] "Socioeconomic status and stroke incidence, prevalence, mortality, and worldwide burden: an ecological analysis from the Global Burden of Disease Study 2017" Abolfazl Avan, Hadi Digaleh, Mario Di Napoli, Saverio Stranges, Reza Behrouz, Golnaz Shojaeianbabaei, Amin Amiri, Reza Tabrizi, Naghmeh Mokhber, J. David Spence andMahmoud Reza Azarpazhooh, BCM Medicine 2019

A comprehensive safety solution for people wit Aphasia.

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