A multi-tenant system to manage electroencephalogram (EEG) - BeegBrain

João Farias (98679), João Reis (98474), Mariana Rosa (98390) and Ricardo Rodriguez (98388)

Projeto em Engenharia Informática, DETI, Universidade de Aveiro

BeegBrain is a multi-tenant information system capable of receiving and visualizing electroencephalograms (EEG) files from distinct proveniences. Its main focus is to provide intuitive tools for doctors to manage, visualize and write reports about a brain exam in a web environment app. This project aims to improve collaboration between medical institutions since data-sharing and remote diagnosis is a hard and time-consuming process where exams can be lost. Therefore, our web application provides a contract between a medical institution where the exams are taken (medical providence) by operators and a medical revision center where the exams are analyzed by doctors. The system architecture is simple, the RESTful API, the data layer and the data access are supported by Django, connected with a MySQL database and, regarding the frontend, the Angular Framework was used. With our platform, it is possible to have tele-EEG services in the cloud, working as a marketplace broker for examination producers and neurologists. The implemented role-based access mechanism is flexible enough to support distinct use cases with data security and privacy. It is possible to set up distributed reviewing processes, create worklists by doctors, and access patients' previous examinations. The visualization of dozens of vital signal channels obliges us to design efficient and intuitive strategies for plotting the signals, with multiple tools that help analyze the EEG. Examples of implemented visualization features users are allowed to do are the selection of specific channels, zoom, speed change and panning. Finally, a small business intelligence module was developed with various statistics, graphs, and reports. In conclusion, this platform can improve health professionals' daily tasks, due to the fact that it has a high-performance visualization of EEGs and they are available online. Therefore, doctors and operators can access it anytime and anywhere.

Index terms: Electroencephalograms, medicine, medicine tool