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SclerosisCare

Our vision

SclerosisCare, our revolutionary telemedicine app, aims to provide comprehensive monitoring for patients facing the complex reality of Multiple Sclerosis. Through Bluetooth connectivity with a Bitalino device, enables the collection of crucial electrocardiogram (ECG) and electromyography (EMG) data. This innovative approach allows patients to easily and securely send data to our central server, which manages a protected database. In addition to simplifying the monitoring process, SclerosisCare takes full advantage of the benefits of telemedicine, providing patient convenience while ensuring information security and accessibility.

The next level of the SclerosisCare app involves two specialized variants: the doctor and server version. The data stored in the server is designed to be accessible exclusively by the patient and their doctor, ensuring confidentiality and privacy. Patients can review their own records, while doctors can access information for all their patients. This structure ensures personalized, patient-centered care, allowing healthcare professionals to make informed decisions based on the collected ECG and EMG data in an accurate and detailed manner.

Our mission

Multiple Sclerosis (MS) is a chronic neurological disease that affects the central nervous system. Ongoing care and monitoring are essential to assess disease progression and design effective treatment strategies. Electrocardiogram (ECG) and electromyography (EMG) data collection becomes critical due to the intricate connection between the nervous system and these physiological signals.

The ECG records the electrical activity of the heart, and in patients with multiple sclerosis, changes in this activity may be linked to neurological complications. On the other hand, electromyography (EMG) measures the electrical activity of muscles, offering crucial information about muscle function. In the context of Multiple Sclerosis, where muscle weakness and fatigue are common symptoms, accurate monitoring of muscle activity through EMG provides valuable data to assess disease progression and adjust therapeutic strategies. Early detection of changes in these physiological signals may allow for more effective intervention and adaptation of treatments to improve the quality of life of patients with multiple sclerosis.

SclerosisCare is designed for patients to submit ECG or EMG data per test, addressing the complexity of the fluctuating symptoms of multiple sclerosis. Focusing on one reading at a time provides a clearer and more specific view of disease-related events, allowing for more accurate analysis. This approach not only optimizes the quality of the data collected, but also promotes higher throughput by reducing the amount of data handled per test.

Structure and function of SclerosisCare

As explained above, our application allows the collection of ECG and EMG data from a patient, which is sent to a server where it is stored in a database and can then be reviewed by doctors and by the patient himself.

Around this approach, SclerosisCare is structured in three versions of use: client, doctor and server.

The client version will be the one used by the patient. It implements a simple and intuitive graphical interface that provides a pleasant patient experience.
To access our services, each patient will need to have a user account that allows them to identify themselves and access their profile. Therefore, when starting the app, each patient must enter their username and password or register if it is the first time using our services. Each client's password is sent in encrypted form to the server, which constitutes a secure system that maintains the privacy of each patient. If our server does not find that user in the database, it will not give them access. Similarly, an error message will be displayed in case of leaving any of the required fields unfilled when registering and as is evident, the log-in.
Once accessed in their profile, each user has the possibility to consult all the tests carried out to date, being able to access the specific data of each test, showing date of performance, type of signal collected (ECG / EMG), frequency and the values obtained. On the other hand, they will also have the possibility to take a new test. To perform the test, the patient must have the electrodes connected to the part of the body that you want to monitor and the Bitalino connected to the computer via Bluetooth. If any errors occur during the test, the client will be notified by an error message in the interface. Once connected, you can specify the type of signal you want to be captured, the physical address of the device (MAC address) and the frequency in Hz with which you want the signal to be collected.

In the case of doctors, when logging in, our server will search the database for the clients assigned to that doctor. These will be displayed on their interface, along with name and patient ID. The doctor will simply have to select the patient to see the list of tests corresponding to that patient. At this point, the doctor will have the possibility to analyze the data collected in each of the tests. To do this, the doctor simply has to select the test, which is shown in said list along with its frequency, the date on which the test was performed and the type of signal.

Both the doctor and the patient will be able to log out and terminate the connection with the server whenever they want using an option called 'log out'.

SclerosisCare provides its services to our clients through a server which receives and sends information to the different doctors / clients and stores their data in a database. This server uses the TCP communication protocol and allows the simultaneous connection of several clients/doctors. The server and database are controlled by an

administrator, who will have the power to close the server if he chooses. It stores user information (ID, username, password, ID of the role you perform (1-client, 2-doctor)), doctor (ID, name, user id), client (ID, name, doctor id who has access to your data, user ID) and test (ID, date, signal, frequency, monitored values, client ID). Our database is designed to achieve greater convenience when accessing data, in an efficient and organized way.