CASE STUDY

IOT SOFTWARE DEVELOPMENT KIT FOR BIO SENSORS AND BIO PROCESSORS

Client Background

Our client provides the world's most advanced technology for use in smart phones, consumer electronics, and computing platforms. This includes bio processors capable of monitoring multiple biosignals simultaneously that provide accurate, real-time data for diverse healthcare and fitness wearable applications.

soft**serve**

Business Challenge

The transmission, storage and real-time processing of high-frequency bio signal data using wireless, low power channels is challenging. With wearable devices, data sampling is continuous and battery consumption often has to be minimized to allow for days of operation on single charge. Monitoring bio signals is usually accomplished by sending raw sensor data to an edge device like a smartphone, processing the data and sending it to the cloud. Bringing real-time feedback to the user causes the battery power of smartphones to be consumed rapidly, limiting practical application of the solution.

Project Description

In order to reduce the battery consumption rate in end user devices, SoftServe moved part of signal processing logic to a wearable device DSP. By sending only small fraction of data, the network bandwidth would be reduced; indirectly impacting battery life on both wearable and smartphone devices.

SoftServe's R&D team developed a multi–sensor data acquisition and processing platform, utilizing wearable, mobile and cloud–based service solutions over an Internet of Things (IoT) communications infrastructure. Specifically, fog and edge computing architecture was implemented using wireless sensors, BLE connectivity, smartphone and cloud processing to enable real-time readings of human vital signs and other biosensors and motion data. This was streamed from smartphones to cloud based storage and dashboards. Android devices support sensor configuration, signal real-time monitoring and sending data to cloud server via UDP or TCP channels. User may access recorded data or real-time streams from any modern web browser.

The R&D team also implemented and tested the thirty most used signal processing functions in C for ARM DSP on simulators and hardware. The testing process was automated, from compilation to flashing and comparing test results with reference data. Then, signal processing algorithms were updated to use the DSP library, do part of processing on a wearable device, and send the processed result to a smartphone via a real-time data stream.

Business Value

By applying reference IoT architectural patterns, smartphones become edge devices that collect raw sensor data and process time series data to extract useful features. Data is then sent to the cloud for storage and visualization.

The IoT software development kit for biosensors developed and implemented by SoftServe doubled the battery life of smartphone devices, allowing extended use of devices for several days.

ABOUT US

SoftServe is a digital authority that advises and provides at the cutting-edge of technology. We reveal, transform, accelerate, and optimize the way enterprises and software companies do business. With expertise across healthcare, retail, media, financial services, software, and more, we implement end-to-end solutions to deliver the innovation, quality, and speed that our clients' users expect.

SoftServe delivers open innovation—from generating compelling new ideas, to developing and implementing transformational products and services.

Our work and client experience are built on a foundation of empathetic, human-focused design that ensures continuity from concept to release.

We empower enterprises and software companies to (re)identify differentiation, accelerate solution development, and vigorously compete in today's digital economy—No matter where you are in your journey.

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