# Development of EEG data acquisition device by using single board computer

## Abstract

Electroencephalogram (EEG) plays a vital role in several medical diagnosis (brain tumour detection, Alzheimer disease, epilepsy, etc.), engineering applications (emotion detection, drowsiness detection, stress assessment, etc.) and others. However, the cost of the EEG device is usually high ($< 20,000$) and it is still a challenging issue for many consumers. The cost of the EEG data acquisition device is purely depends on number of EEG channels, mode of signal transmission (wired/wireless), data resolution, software portability, etc. In recent years, the development of handy embedded systems opens a gateway to design and develop the data acquisition devices at a cheaper cost. In this work, we have used SBC TS 7800 (500 MHz, 128 MB RAM) for designing the EEG wired data acquisition device. This embedded system is used to acquire the data from the 32 EEG channels and to save the them in American Standard Code for Information Interchange (ASCII) values in either .txt or xls format for further research investigations. All the EEG channels are made up of Ag/Ag-Cl and have an impedance of 10 k?. This complete system is operating in Linux platform, and programs are developed using C and JAVA programming languages.

**Keywords —** Data acquisition applications, EEG, electroencephalogram, embedded system