



Real Time Device Control with Brain Computer Interface

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This project explores the use of EEG-based BCI technology to control a robotic car via the ESP8266 module with TCP binding. Our approach demonstrates new possibilities in machine control using brain signals, contributing to advancements in robotics and assistive technologies.

Method

EEG BCI Device Setup: Configured to capture and transmit brainwave signals.

ESP8266 Integration: Programmed for TCP/IP communication with EEG data.

Robotic Car Control: Algorithms developed to translate EEG signals into movement commands.

TCP Binding: Ensured continuous, real-time data transmission for responsive control.

Result

Direct Control: Real-time steering and speed control of the robotic car using only EEG signals.

Real-time Response: Eye blink detection delay/time 1sec+cpu execution time with efficient TCP/IP communication.

Adaptive Algorithms: The car successfully executed the command it received from the TCP message and also send back the feedback.

Motivation

Around 1 billion people, or 15% of the global population, experience some form of disability. In Bangladesh, a 2016 World Bank report estimated that 16 million people, roughly 10% of the country's population at that time, live with disabilities. We are focusing on this market.

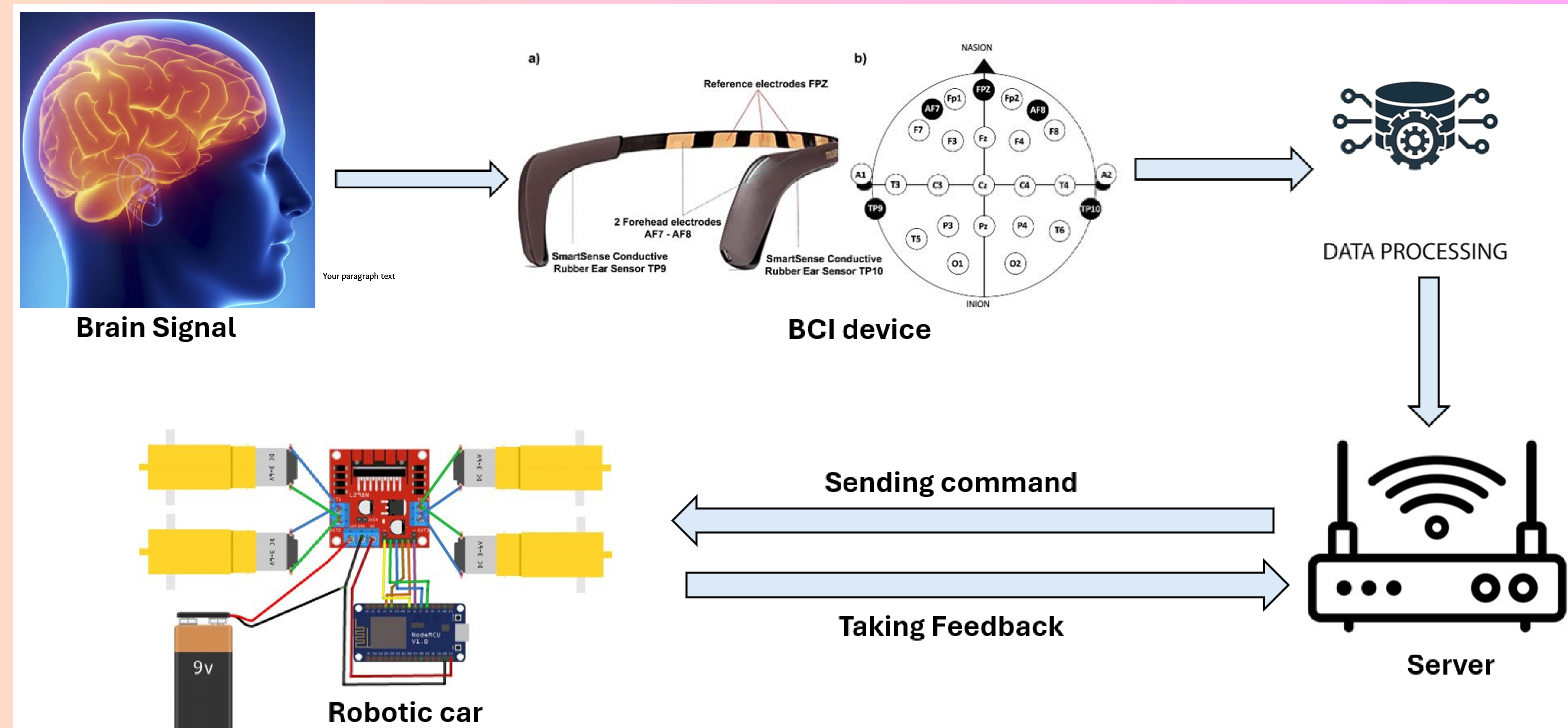
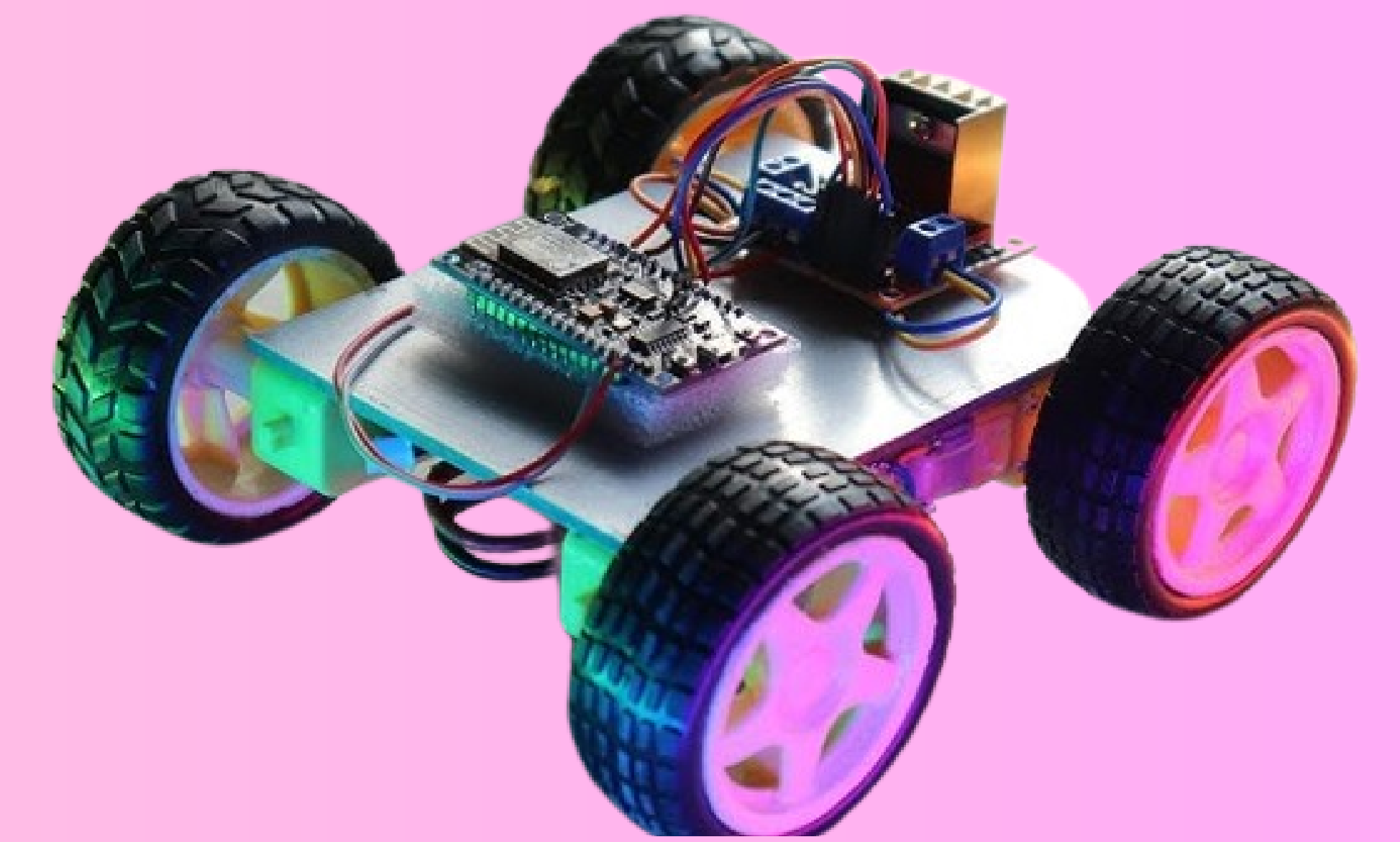


Figure 01: Communication diagram

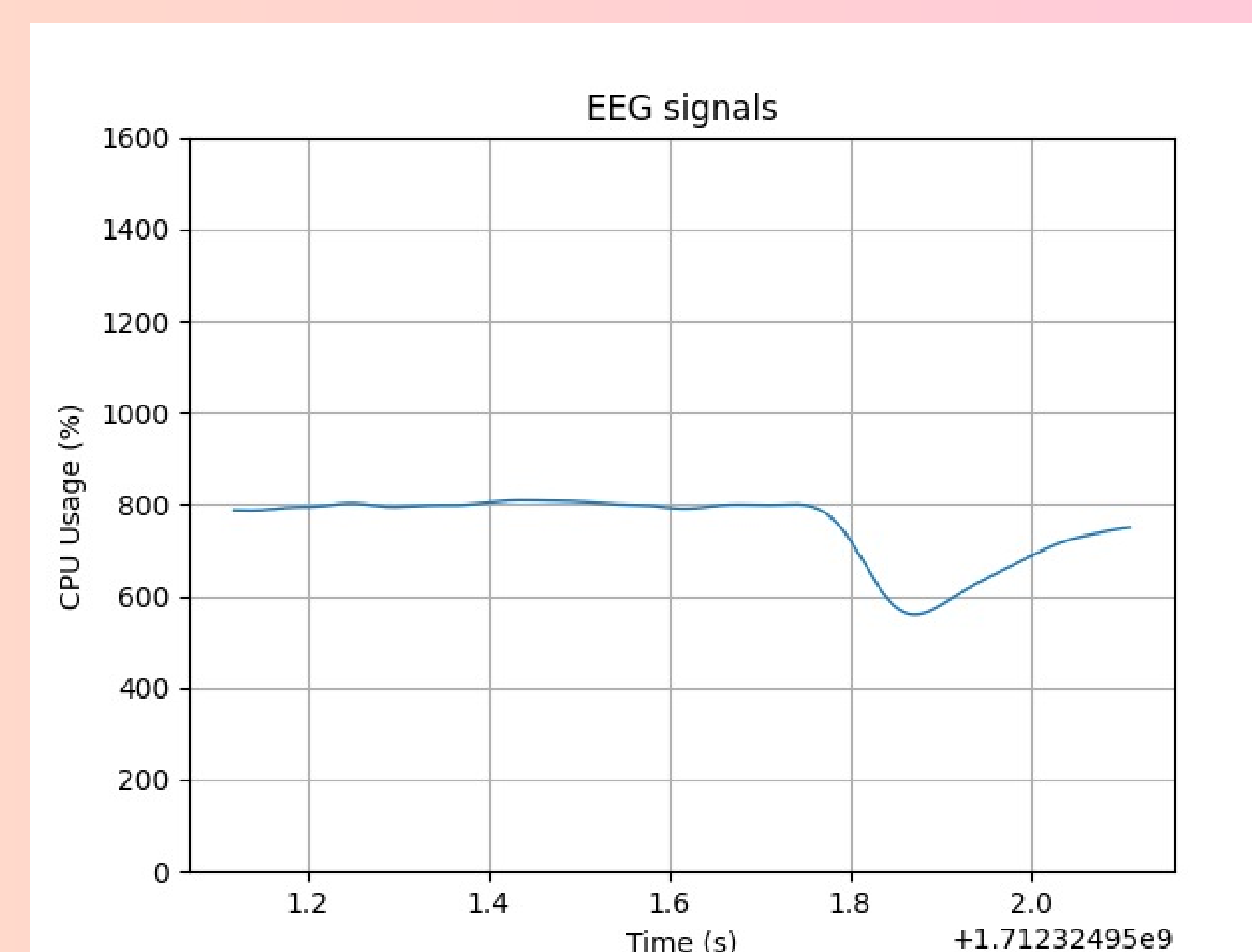


Fig 02: A single blink

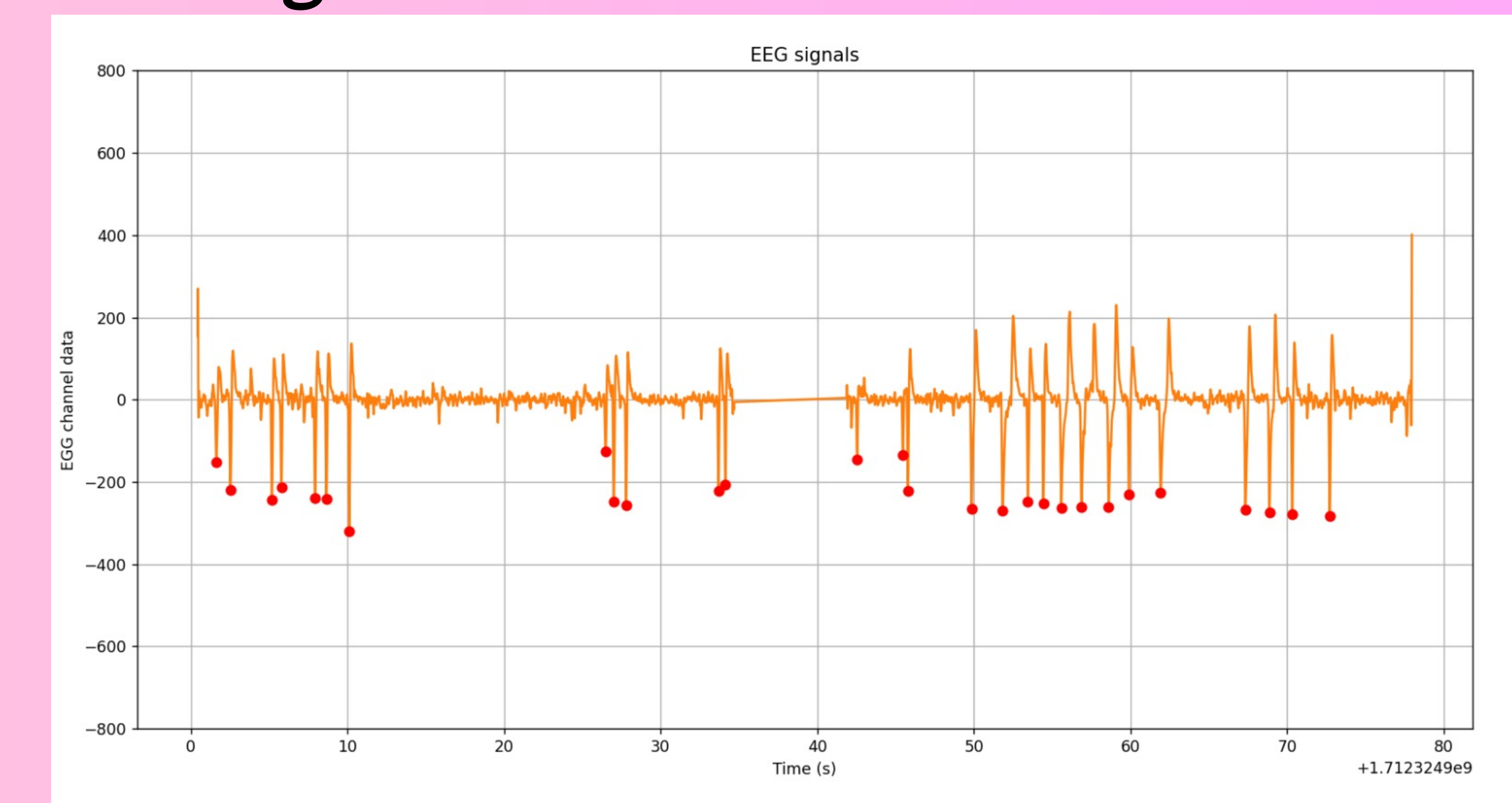


Fig 03: A set of blinks in red dots