Mind FootPrint: Research on the Relationship between Brainwaves and Health Status; and the Development of a Centralized Brainwave Monitoring and Health Analyzing System

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Elderly or people with chronic illnesses such as heart problems may suffer sudden onset of heart attack or stroke when alone in remote countryside or secluded places, making timely rescue difficult and caused irreversible health damage or even death. A research was carried out to find the relationship between brainwaves and one's health or mental status. A system named "Mind FootPrint" (MFP) was developed to monitor the user's health status through detecting and differentiating brainwaves. MFP consists of a brainwave detector concealed inside a hat worn by the user which is connected by Bluetooth to a smartphone App, a server program, an interactive website and cloud storage. The system can measure and analyze brainwaves to determine the health status and provide the location of the user. The data is simultaneously uploaded to the cloud storage and server for remote monitoring. The administrator can be notified and rescue would be sent automatically. A series of sleeping and excitatory state experiments were carried and data collected was employed in the development of MFP. The system was tested out on both healthy people and epilepsy patients. This research shows that delta and gamma brainwaves will become active when a person is in a coma and excitatory state respectively. It was also discovered that the brainwave collected from deep sleep and light sleep experiments were similar to those from published data from coma and fainted patients respectively. In conclusion the brainwaves were drawn out and classified for the following 7 health statuses: coma, faint, hyperactive, excitatory, weak life sign, death and normal. It is hoped that the results could be used for further medical analysis and the use of MFP could help to save lives.