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Portable ECG Monitoring System

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Abstract: *The increasing demand for readily available, ongoing cardiac health monitoring outside of clinical settings led to the creation of the portable electrocardiogram (ECG) monitoring equipment. An extensive description of the planning, execution, and assessment of a portable ECG monitoring system is provided in this paper. The system combines wireless connectivity and cutting-edge biosensing technologies to enable real-time data collection and transmission to healthcare providers via mobile devices. Robust data security methods, a user-friendly interface, and minimal power consumption are important qualities. After testing on a wide range of users, our prototype proved to be highly accurate in identifying common cardiac abnormalities such arrhythmias. According to the findings, portable ECG monitoring devices can greatly improve early diagnosis, prompt intervention, and remote patient care. This could lower healthcare expenditures and improve patient outcomes. Future developments will concentrate on improving algorithm precision, using AI for predictive analytics, and extending the system's functionality to monitor other vital signs. The treatment of cardiovascular illnesses has significantly improved as a result of the development of portable health monitoring devices. The creation and testing of a portable Electrocardiogram (ECG) monitoring system intended to offer in-the-moment assessments of cardiac health outside of conventional clinical settings is presented in this work. The suggested system combines a wireless communication module and a small ECG sensor to allow for continuous, remote monitoring of cardiac activity. With features like automated arrhythmia detection and data storage, the system's design prioritizes accuracy, user comfort, and ease of use. A thorough testing process is used to evaluate performance indicators such as signal quality, battery life, and data transmission dependability in both controlled and real-world conditions. The portable ECG device provides low transmission latency and high sensitivity and specificity in identifying common cardiac problems, according to the results. The system's mobile connectivity and user-friendly interface make it easy to integrate into daily life and give users fast feedback and heart health alarms. This technology might potentially lessen the strain on healthcare systems and improve patient outcomes by increasing early identification and individualized management of cardiac problems. Subsequent efforts will concentrate on optimizing the algorithms of the system and extending its capabilities to accommodate a wider array of cardiovascular data.*

Keywords: Cardiovascular disease, ECG monitoring system, Atmega328p,AD8232 sensor, OLED display.

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