Transforming Telemedicine: Engineering Thermoelectric Health Check System

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COVID-19, a raging worldwide pandemic, is constantly redefining the norm in healthcare systems with new demands and practices. Due to risk of infection, many people are apprehensive to visit healthcare facilities in person for problems and check-ups. My remote health check system with the integrated Bluetooth application aspect will increase diagnostic accuracy, improve ease of usage, and advance existing telemedicine technologies. It aims to simplify existing approaches to telemedicine by providing an all-in-one utility for both healthcare providers and patients to monitor, track, and consult regarding consistent vital measurements. The system will be powered with thermoelectricity and waste heat harnessed from the human body by utilizing Peltier tiles. I tested these at different temperature differences and voltages of 0 to 53 F and 0 to 694.74 mV, amplified by a booster circuit. This revolutionizes patient care as well as contributing to a cleaner environment through green energy. The system is comprised of a MAX30102 pulse oximetry and heart rate sensor and GY906 temperature sensor made effective towards continuous and remote health monitoring through an Arduino microcontroller and programming. These three vitals are factors that are most affected by COVID-19, as it causes decreased blood oxygen levels, increased pulse, and increased temperature. A Bluetooth module was also added to allow remote monitoring, proven effective over many distances. Taking steps to improve and facilitate telemedicine to a higher degree will allow a seamless global transition to online platforms, making healthcare similarly convenient, accessible, reliable, and safe.

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