Sunday CookeyEkpo

(BEng (Hons),CEng, PGCAP, MSc, MA, PhD, SMIEEE, MIET,MAIAA, AIEA, SFHEA)

Self-Powered Radio Frequency Biosensor for Proactive Viral infection Symptoms Monitoring

Viral infections presenta significant challengein health due to its debilitating symptoms, including fever, body aches, fatigue, headaches, coughs, sore throats, nasal congestion nausea, vomiting, diarrhoea, or rashes and blisters on the skin and other secondary-agent symptoms mood swings, irritability, and physical discomfort. Current monitoring methods suffer from limitations in accuracy and invasiveness, hindering effective pre-emptive, preventative and proactive management. This paper proposes a novel approach utilising wearable RF antenna biosensors to empower all in managingviral infection symptoms (VIS) in real-time. The solution integrates cost-effective, non-invasive, and user-friendly sensors powered by RF energy harvesting technology. The device employs a temperature sensor todetect increases in body rest temperature and a Galvanic Skin Response (GSR) sensor to measure skin conductance, which is related to stresslevels caused by a secondary-agent condition(s), thereby detecting their combined symptomsaccurately. The RF energy harvester achieves an efficiency of 58% with anoutput voltage of 1.5 V and output power of 15 mW, ensuring sustainability. The novelty of this approach lies in its accuracy (> S7%), sustainability, and real-time monitoring capabilities, offering a promising solution for improving people's lives affectedby complex viralinfections and secondary-agent disorder(s). Future directions include exploring the potential of this technology for broader applications such as sub-microscopic infectiousagent symptoms tracking, stress management, chronic disease monitoring. and general health metrics tracking.

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