


Chapter 9


Smart Monitoring of Parkinson's Disease With Cloud-IoT Technologies

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ABSTRACT

Millions of people worldwide suffer from Parkinson's Disease (PD), a progressive neurodegenerative disease characterized by both motor and non-motor symptoms. Healthcare has been greatly benefitted by the emergence of IoT which finds its application to be allowed more secure as well as it instantaneous remote patient monitoring to improve the quality of life. The conventional methods of tracking Parkinson's disease mainly require routine clinical evaluations, which often fall short of fully capturing the daily variations in symptoms that make challenging in accurate diagnosis. The emergence of Cloud-IoT technology presents a novel

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approach by supporting current real time patient monitoring to the controlling of Parkinson's disease. The wearable sensors can collect physiological and behavioral data that can be processed and analyzed in cloud based platforms. The study also investigates the potential of these technologies to improve the overall results for an individual suffering from Parkinson's disease, reduce healthcare costs, and improve patient-centered care.

1. INTRODUCTION

Healthcare has benefited tremendously from the introduction of IoT and its application, which have made it more secure and enabled instantaneous remote patient monitoring, ultimately raising living standards. A network of healthcare professionals, including physicians, nurses, specialists, and allied health workers, supports the healthcare industry and collaborates to provide treatment to patients. Patients are typically monitored upon admission to hospitals and other healthcare facilities. After being released, they are typically on their own and need self-surveillance. They only visit their doctors again when things get really bad, at which point they may need to be admitted. When it comes to patients who are critically sick or in need of emergency care, this delay can be fatal. By informing doctors in advance of possible medical problems, smart health monitoring addresses this issue. They can quickly intervene and provide care.

Millions of people are progressively affected by Parkinson's disease, a chronic neurodegenerative disorder that is characterized by at least one additional symptom: resting tremor or rigidity and reduced slow movement (bradykinesia). Dopamine deficiency in basal ganglia circuits and dopaminergic neuron loss in the substantia nigra pars compacta (SNc) are the causes of these effects. Individuals suffering from Parkinson's disease might face motor and non-motor symptoms. Motor symptoms typically include bradykinesia, muscle rigidity, tremors, and problems with balance. Patients frequently encounter various non-motor symptoms, including mental health issues like depression or anxiety, cognitive difficulties impacting or the ability to make decisions, and physical discomfort such as pain. Parkinson's disease (PD), traditionally categorized as a movement disorder, is now acknowledged to encompass more than just motor symptoms. It has been observed that the disease extends beyond the substantia nigra (SNc) peripheral devices, affecting various regions of the brain (Tolosa et al., 2021). Parkinson's disease can be categorized into three distinct groups: genetic, neuropathic, and sporadic. Each group is identified by the presence of specific structures known as Lewy bodies (LB) and Lewy neuritis (LN) (Lotharius & Brundin, 2002). It is widely recognized that Parkinson's disease

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