Nearly one-third of patients with epilepsy still suffer from seizures despite receiving optimal medication management. In such cases, systems that detect seizures may help improve outcomes by providing more personalized therapies and also play a crucial role in preventing accidents and sudden unexpected death in epilepsy (SUDEP). Over the past few decades, various methods have been developed to detect seizures using scalp and intracranial EEG, electrocardiography, accelerometry and motion sensors, electrodermal activity, and audio/video capture. However, it is still unclear which combination of detection technologies is most effective, and the approaches may need to be customized. For everyday use, a seizure detector should be affordable, comfortable, and socially acceptable, leading to alternatives to EEG-based techniques. Therefore, We designed a special wrist-worn IoT-based device integrated with a Random Forest model for the automatic detection of generalized seizures using sensors that measure sympathetically mediated electrodermal activity (EDA) and accelerometry. This system has the potential to serve as a convulsive seizure alarm system for caregivers and provide objective quantification of seizure frequency.

We cover the implementation of our wearable device in this report. The first chapter discusses recent research and findings in predicting and detecting epileptic seizures, comparing various approaches. The second chapter outlines our project plan. In the third chapter, we explain how to implement each aspect of the project, including hardware, machine learning model, and mobile application. The fourth chapter summarizes the results and analyses the outcomes, concluding with an evaluation of the project. Lastly, the fifth chapter presents a future plan for developing this idea to make it more accessible and beneficial for patients.