Development of IoT based Maximum Power Point Tracking with Fault Detection Techniques

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The primary objective of this study is to detect the faulty PV panel amidst a significant number of PV panels that are operational in the real phase. The number of PV plants worldwide is rapidly increasing, and they necessitate continuous monitoring to maintain high performance. However, identifying a specific PV panel in a large plant can be challenging. Although monitoring systems are available in the market, they are expensive, require significant investment, and it is challenging to obtain information about a single panel. In this study, a cost-effective device has been developed that monitors each PV panel in real-time, and its cost is lower than the current monitoring systems. The device is connected to a central server that sends messages to small devices, making it more flexible to observe from anywhere in the world.

Fig.1

The detection of faults plays a crucial role in improving the performance of PV panels. A single faulty panel in the operational phase can significantly reduce the overall system's performance. Identifying the type of fault can suggest various solutions to improve the efficiency of the system. This study aims to continuously monitor the panels and detect the level of fault through artificial intelligence. This process helps to identify and eliminate faults, ultimately improving the efficiency of the PV panel system.

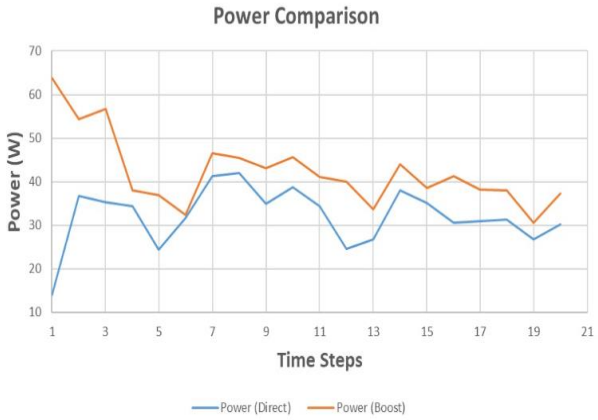

Fig.1 P-V curve from real time data

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