

## **Optimisation of fuzzy based maximum power point tracking in pv system for rapidly changing solar irradiance**

### **Abstract**

Solar photovoltaic (PV) electrification is an important renewable energy source. The electric which is converted directly from solar irradiation via PV panel is not steady due to different solar intensity. To maximize the PV panel output power, perturb and observe (P&O) maximum power point tracking (MPPT) has been implemented into the PV system. Through a buck-boost DC-DC converter, MPPT is able to vary the PV operating voltage and search for the maximum power that the PV panel can produce. The implementation of fuzzy logic is proposed in this paper. Based on the change of power,  $dp$  and change of power with respect to change of voltage,  $dp/dv$  fuzzy determines the size of the perturbed voltage. In this paper, the performance of fuzzy logic with various membership functions (MFs) is tested to optimize the MPPT. Fuzzy logic can facilitate the tracking of maximum power faster and minimize the voltage variation. Simulation results show that the performance of fuzzy based MPPT with five membership functions (5MFs) is better than fuzzy based MPPT with three membership functions (3MFs), followed by the conventional P&O MPPT.