

# To Extract Maximized Power of Solar PV Arrays during Complex Partial Shading Conditions using Metaheuristics

## ❖ Proposed Solution (Describe your Idea/Solution/Prototype)

- For large photovoltaic power generation plants, number of panels are interconnected in series and parallel to form a photovoltaic (PV) array. When partial shading occurs on the panel like cloud passage, building shade and bird droppings, etc. Due to that partial shade occurs which result in decrease in power output and introduce multiple peaks in the P–V curve.
- As a consequence, the modules in the array will deliver different row currents. Therefore, to maximize the power extraction from PV array, the panels need to be reconfigured for row current difference minimization.
- To Resolve this problem, We are proposing a **Metaheuristics based dynamic solution**.
- In this method, a new matrix of the PV array is obtained respective to the shading pattern where, the physical location of the modules remains unchanged, while its electrical connections are altered.
- Extensive simulations with different shade patterns are carried out and thorough analysis with the help of  $I$ – $V$ ,  $P$ – $V$  curves, usefulness of the proposed method is verified.
- The effectiveness of proposed method is evaluated via performance analysis based on energy saving and maximized output power of PV array/panel.

