

Hotspot detection of solar photovoltaic system : A perspective from image processing

Binti Ishak, Nurul Huda^a; Sazanita Binti Isa, Iza^a; Bin Osman, Muhammad Khusairi^a; Daud, Kamarulazhar^a; Bin Jadin, Mohd Shawal^b

^a Universiti Teknologi Mara, Centre for Electrical Engineering Studies, Cawangan Pulau Pinang, Permatang Pauh, Pulau Pinang, 13500, Malaysia

^b Universiti Malaysia Pahang, Faculty of Electrical and Electronics Engineering Technology, Pahang, Pekan, 26600, Malaysia

ABSTRACT

Research in solar energy has rapidly grown since its significant and contributes to the advancement in clean renewable energy technology. Effective energy management such as fault detection impacts the early-stage monitoring for the efficiency, reliability, and safety of solar photovoltaic (PV) systems. The formation of a hotspot is one of the issues commonly occurred in a PV system. However, the main limitation of hotspot detection is the difficulty to interpret specific components with erratic temperatures in the thermographic images for attributes in the intelligence detection model. In this study, a review of hotspot detection in solar PV panels using the image processing method is established based on the image processing field. The integration of image processing approach can further assist in developing automated fault detection in solar PV farms for effective preventive monitoring methods. Therefore, several aspects need to be categorized and considered accordingly for achieving accurate prediction. Several ways were discussed, and future research is suggested in this study.

KEYWORDS

Hotspot; Image processing; Solar PV system

ACKNOWLEDGMENT

The authors wish to thank Centre for Electrical Engineering, Universiti Teknologi MARA, Cawangan Pulau Pinang for administrative and facilities supports. Special thanks to Universiti Malaysia Pahang, Pekan, Malaysia.