On-site inspection of PV systems has been historically performed through visual inspection, infrared (IR) thermography, and electrical measurements. Recent advances and cost reductions in unmanned aerial vehicle (UAV) technology has led to adoption of UAVs equipped with thermal cameras for inspection of PV plants, which survey power plants in a fraction of the time and cost than walk through IR imaging. IR imaging however, is limited only to detection of certain fault types that result in elevated temperatures. Techniques such as electro-(EL) and photo-(PL) luminescence imaging offer a higher level of image detail and qualitative insight compared to IR thermography. Furthermore, detection and identification of incipient or severe faults in PV panels is more straightforward. This project proposes for the first time a fast and accurate automatic drone-based inspection method for large PV plants that combines IR, EL, PL imaging, and visual images (VI), called DronEL. The overarching goal is to correlate these images with known PV failures such as hotspots, cell cracks, and potential induced degradation. The DronEL project is carried out by a number of academic and commercial partners including Denmark’s Technical University (DTU), Aalborg University (AAU), Sky-watch, SiCon and Kenergy.

General information
Publication status: Published
Organisations: Department of Photonics Engineering, Diode Lasers and LED Systems, Department of Energy Conversion and Storage, Organic Energy Materials, Aalborg University
Contributors: Riedel, N., Benatto, G. A. D. R., Thorsteinsson, S., Poulsen, P. B., Spataru, S., Sera, D.
Publication date: 2017

Host publication information
Title of host publication: PV Reliability Workshop
Source: FindIt
Source ID: 2355411147
Research output: Chapter in Book/Report/Conference proceeding › Article in proceedings – Annual report year: 2017 › Research › peer-review