Correcting for Perspective Distortion in Electroluminescence Images of Photovoltaic Panels

With the significant growth in the number of photovoltaic (PV) installations and their size, regular PV system inspection has become a challenge. Aerial drone imaging, based on visual, thermographic, and more recently luminescence, can be viable solutions for PV inspection. However, to achieve effective detection and quantification of failure based on images acquired form Unmanned Aerial Vehicle, there is need for image quality enhancement and correction of distortions, inherent to the drone measurement process. In this work we propose methods to automatically correct the perspective distortion in electroluminescent (EL) images of PV panels. We identified two main cases of perspective distortion: when the imaging plane is parallel to the panel plane or not, and propose methods to correct both. For both cases, the proposed method yields good results, as assessed by visual evaluation.