

# Aerial photography of photovoltaic panels on rooftops

How to identify solar panels on rooftops from satellite imagery?

In this post, we discuss how you can identify solar panels on rooftops from satellite imagery using Amazon Rekognition Custom Labels. High-resolution satellite imagery of urban areas provides an aerial view of rooftops. You can use these images to identify solar panel installations.

Can UAV images be used to collect rooftop PV samples?

UAV images are used to collect rooftop PV samples. The UAV flight was carried out in Hai'an County (yellow box in Fig. 1b), where the development of rooftop PVs is relatively advanced. Ground control point (GCP) data obtained by continuous operating reference stations were used for georeferencing.

Can solar panels be segmented from images?

A field survey with manual data collection can obtain rooftop PV panel installation capacity with high precision but labor-intensive, time-consuming, and expensive. Using a satellite/aerial-image-based approach offers a new way to solve large-scale PV panel installation - segmenting solar panels from images, and has been widely discussed recently.

Can U-nets be used to segment roof-top PV panels in satellite images?

In 2020, Zhuang et al. proposed a cross-learning driven U-Net (CrossNets) method to segment roof-top PV panels in satellite images. However, the above studies focused on using the universal machine learning frameworks such as CNN, U-Net, DeepLabv3 and etc., lacking analyzing the characteristics of PV image data and improving the models.

Why is aerial image analysis important for solar energy systems?

"Its accurate segmentation and identification of solar energy systems from aerial images hold substantial practical value, facilitating efficient assessment of panel performance, maintenance requirements, and energy production estimation."

Can satellite and aerial photography provide accurate PV information?

With the advance of spatiotemporal resolution of onboard sensors, satellite and aerial photography can provide up-to-date images of specific ground targets, making them an ideal source for obtaining accurate PV information (Perez et al., 2001; Peters et al., 2018; Wang et al., 2018).

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Aerial imagery with a GSD of 0.3 m is used to collect samples of distributed ground PVs. The aerial photography was conducted by the Provincial Geomatics Center of Jiangsu in 2018, covering the whole of Jiangsu ...

The quantity of rooftop solar photovoltaic (PV) installations has grown rapidly in the US in recent years. There is a strong interest among decision makers in obtaining high quality information about rooftop PV, such as the locations, power capacity, and energy production of existing rooftop PV installations. Solar PV installations are typically connected directly to local power ...

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The dataset of 2,542 annotated solar panels may be used independently to develop detection models uniquely applicable to satellite imagery or in conjunction with existing solar panel aerial ...

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in panchromatic and 3.2 m in blue, green, red and near infrared bands. Aerial imagery with a GSD of 0.3m is used to collect samples of ground distributed PVs. The aerial photography was conducted by the Provincial Geomatics Centre of Jiangsu in 2018, covering the whole province. UAV images are used to collect rooftop PV samples.

Engineers team survey check solar panel roof. Specialist technician professional engineer with laptop and tablet maintenance checking installing solar roof panel on the factory rooftop under sunlight. ... Blue shiny solar photo voltaic panels ...

Step 6: Solar Panel Direction. Orientation, or the direction your roof faces, may have a large impact on how productive roof-mounted solar panels will be. ... Reading Time: 5 minutes As the demand for solar panels continues to grow, many homeowners are drawn to the benefits of solar energy roof systems, including long-term savings and ...

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Also according to the research, the U-net model can be trained on aerial images with a resolution of 128 x 128 pixels, and achieve accuracy that is not significantly poorer than it does with a ...

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We established a PV dataset using satellite and aerial images with spatial resolutions of 0.8 m, 0.3 m and 0.1 m, which focus on concentrated PV, distributed ground PV and fine-grained rooftop PV ...

The image classification step determines whether a PV system is present in an aerial image; if this is the case, the PV segmentation step determines the area covered by the PV system; the PV geocoding step then assigns the real-world coordinates to the PV system; finally, based on the coordinates, the data fusion adds 3D building data in order to determine the PV ...

The following is an example image of the labeling job. The labeler can draw bounding boxes of the targets with the selected labels indicated by different colors. We used three labels on the images: rooftop, rooftop-panel, ...

Accurate identification of solar photovoltaic (PV) rooftop installations is crucial for renewable energy planning and resource assessment. This paper presents a novel approach to ...

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