

Master's thesis: Solar module glass crack detection using CNN

The Helmholtz Institute Erlangen-Nuremberg for Renewable Energies (HI ERN), part of the Forschungszentrum Jülich, researches and develops material- and process-based solutions for climate-neutral, sustainable and cost-effective utilization of renewable energies.

Aim: To develop a convolutional neural network that can be used to detect cracks in solar module glass. In lieu of developing a new CNN, use already existing image analysis CNNs for glass crack recognition and compare their effectiveness using parameters such as test accuracy, test loss, recall, F1 score, etc.

Project Steps:

- Take images of solar modules with glass cracks.
- Develop a CNN and train it using the images taken. Or, train already existing CNNs on the images taken.
- Determine/compare the effectiveness of the CNNs to detect cracks in solar module glass.

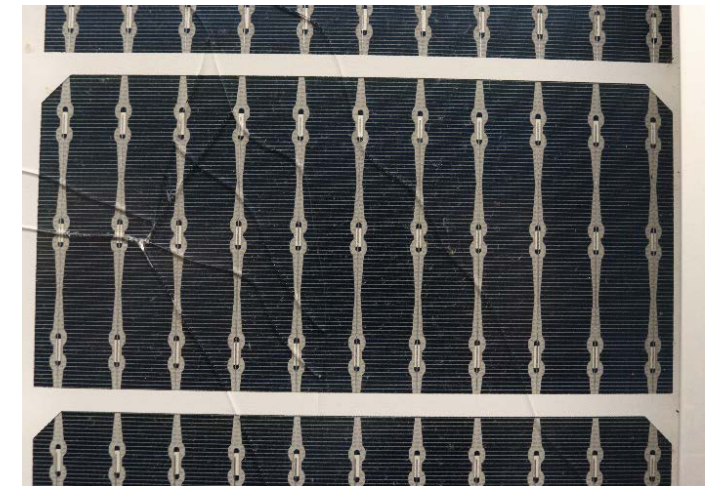
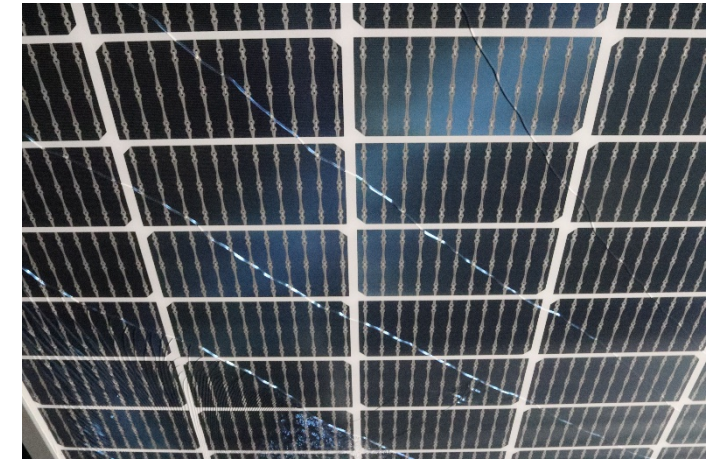
Qualifications:

- Student of Master Science, Chemistry, or Physics.
- Strong experience in a programming language (Python) and deep learning is beneficial.

Note: Students of MWT, NT, Energy Technology, Advanced Materials & Processes (MAP) can be directly examined. Students from other disciplines require an examiner from their department.

Sources:

- <https://www.mdpi.com/2673-9941/3/4/36>



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