Data Driven I-V Freature Extraction for PV modules

Paper presentation

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Motivation

- Performance parameter extracted from I-V data set : Pmp, Voc, Isc, Rs, Rsh, FF are essential for diagnosing degradation of PV modules
- Data driven technique can be applied to a **large amount** of data in a **short time** in contrast with traditional fitting of diode equation
- Applied to 2.2 million real I-V datasets, took 3 hrs to complete
- No requirement of device parameter to be input from the researcher
- Applicable on non standard I-V datasets having **multiple steps**

Method

1. **Fit smoothing spline** on raw I-V dataset (insufficient points near Voc/unequal spacing) to get 500 equal spaced points in voltage
2. Regression performed on **moving window** of 5 consecutive I-V points
3. **Slope** of each regression line is used to identify either **step or MPPT**
4. **Identify the segments (steps)** : Steeper slope on the left than right
5. If step is found, I-V feature is extracted separately for both the parts

Figure: lion!!

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