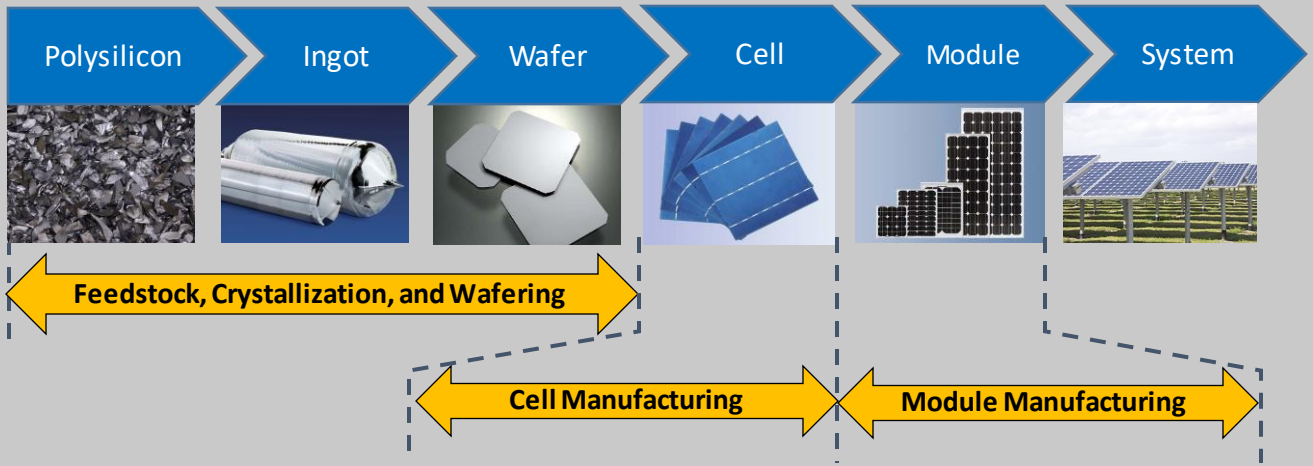
Photovoltaic Module Health Check using EL and ML

The Photovoltaic Supply Chain:



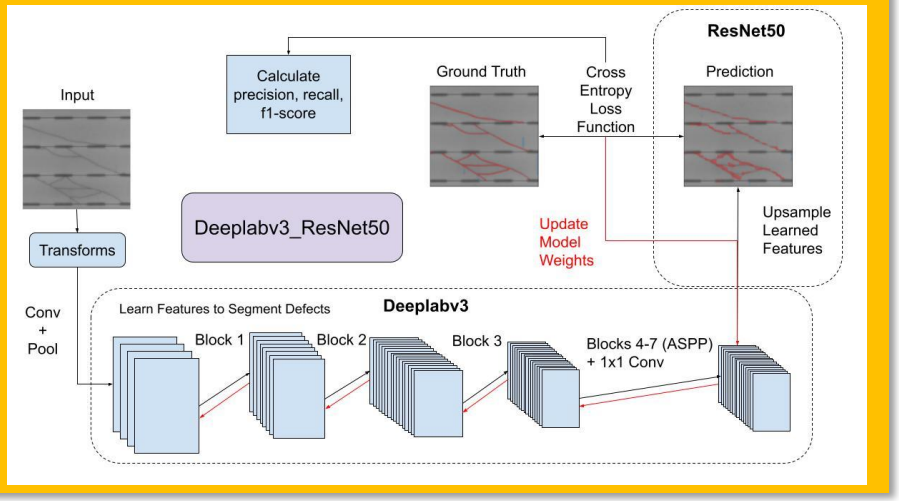
Davis, Kristopher O., Marianne P. Rodgers, Giuseppe Scardera, R. Paul Brooker, Hubert Seigneur, Nahid Mohajeri, Neelkanth G. Dhere, et al. "Manufacturing Metrology for C-Si Module Reliability and Durability Part II: Cell Manufacturing." *Renewable and Sustainable Energy Reviews* 59 (2016): 225–52. https://doi.org/10.1016/j.rser.2015.12.217.

Current Model:

- Input: Electroluminescence Images of Solar Modules and Cells
- Output: Detection and localization of various defect categories, and an analysis of defect impact on module power data

Future Plans:

- Customization and tuning for other defects and modules.
- Explore semi-supervised learning to improve the model's capabilities.



Our Vision:

- Present capabilities of automation in module manufacturing quality control and field module health checks.
- Phase out the need for human inspection and replace it with a Machine Learning Solution.
- Develop a user-friendly software solution capable of real-time defect detection for both manufacturing and O&M.
- Create customizable personalized models trained specifically for use, as requested by the consumer.
- Generate a commercialization plan for future development.