

# Machine Learning to Analyze the Accelerated Aging of Perovskite Solar Cells

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## **Abstract**

Perovskite solar cells have improved in efficiency and stability over the last decade, but we still lack commercially viable perovskite solar cells. To estimate the carbon footprint and energy returns, it is crucial to understand the lifetime of solar cells or the total energy yield. In this study, we are planning to do accelerated aging to understand the breaking points of perovskite solar cells. With the help of machine learning and drift-diffusion models, we are trying to extract the parameters of solar cells from the J-V plot. A machine learning model will analyze a series of J-V curves and give the insights that lead to change in J-V. The machine learning models were trained using the data generated by drift-diffusion model. While the applicability of this approach to experimental data is still being investigated, successfully generalizing the model to experimental data could enable us to analyze the causes of degradation. This, in turn, could be enhanced through interface engineering and material optimization.

## **Keywords**

Stability, Accelerated Aging, Machine Learning