



Bachelor- or master thesis:

Simulation und Machine Learning Methods for Next Generation Solar Cells (June 2020)

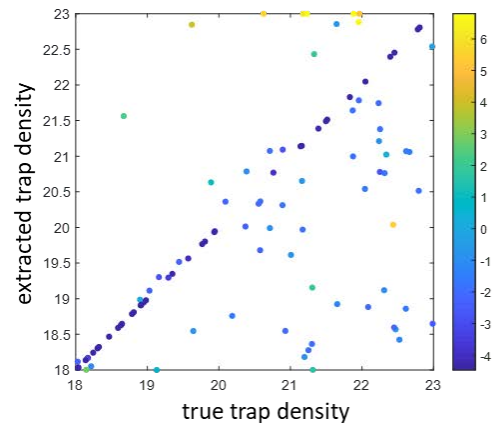
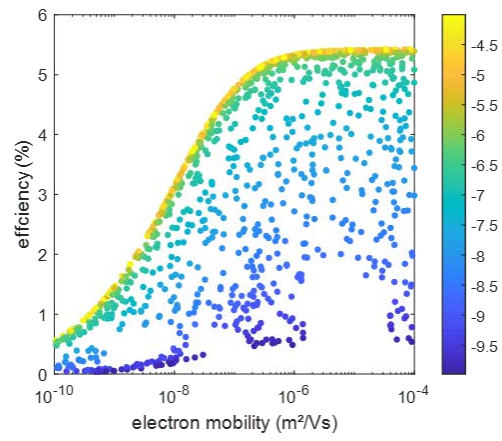
At HI-ErN, we have developed an automated setup for the fabrication and characterization of printable solar cells such as organic photovoltaics and perovskites. This high-throughput approach allows us to test a large number of material combinations in a short time. One component of this approach is the simulation of the IV characteristics with the aim to extract the most important parameters for a certain material or for certain processing conditions.



automated solar cell fabrication with a robot

At the moment, we have computational tools available to generate IV curves from known input parameters. The aim of this thesis is to compare different algorithms and particularly machine learning approaches (e.g. neural network, Bayesian inference) with the aim of accurate and efficient parameter extraction from simulated or experimentally measured curves.

For this thesis, we are looking for a student with interest in programming and the application of numerical methods as well as the working principles of solar cells. Previous knowledge of Matlab and/or Python is beneficial. You will gain experience in the application of current machine learning methods, deepen your understanding of device physics and additionally receive insight into the fabrication and characterization of organic solar cells. The thesis can be written in German or English.



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