

# Bayesim: a tool for fast device characterization with Bayesian inference

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## INTRODUCTION

motivation (within PV and beyond) citing examples of our application of this idea so far (Joule paper and PVSC proceeding)

## MODEL

- background on Bayes theorem
- particulars about how it can be applied to fitting problems we're interested in
- advantages over traditional fitting approaches
- figure 1

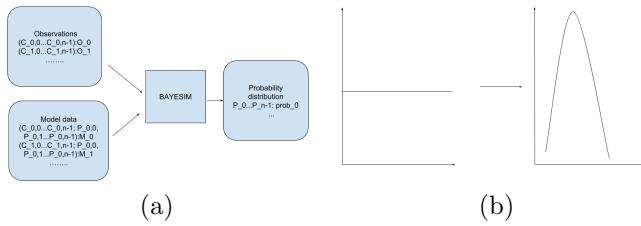


FIG. 1. (a) Scheme (b) Probability

## SOFTWARE ARCHITECTURE AND INTERFACE

- description of structure of new code and workflow for using it (both Python scripting and command-line)
- figure 2

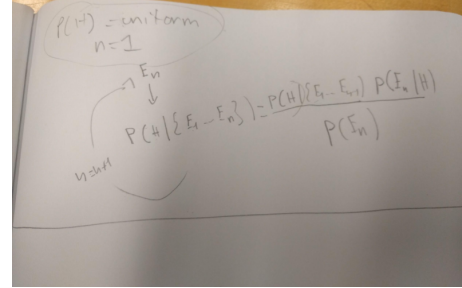


FIG. 2. Bayesian workflow

## APPLICATION EXAMPLES

### Ideal Diode Model

- validation example - “observed” data is just generated using the model and we show we can recover the correct input parameters
- figure 3 showing PMF (animation in ESI)

### Example with Real Data

- more practical example - probably fitting resistive diode to the same SnS data we used in the Joule paper
- figure 4 showing PMF (animation in ESI) and comparison of JV curves

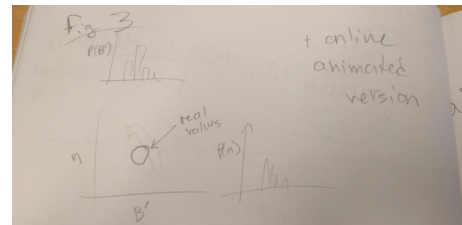


FIG. 3. Ideal diode

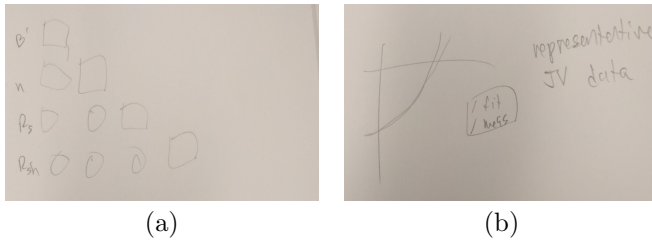


FIG. 4. Real data

Maybe an example with a numerical model like  
PC1D

Maybe a non-PV example

thermoelectrics? TIDLs?

## CONCLUSIONS

## ACKNOWLEDGEMENTS

## APPENDIX

- include minimal code to run ideal diode example
- link to Github repo (which has installation instructions and documentation as well as list of planned future features)

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