

Master Thesis Green AI

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How do you choose a thesis project?

When you don't know where to start...

DOs

- ❖ Make sure you have a sufficient spread in your IEP
- ❖ Contact a professor that you had a good experience with

DON'Ts

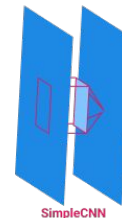
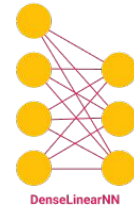
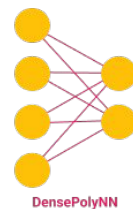
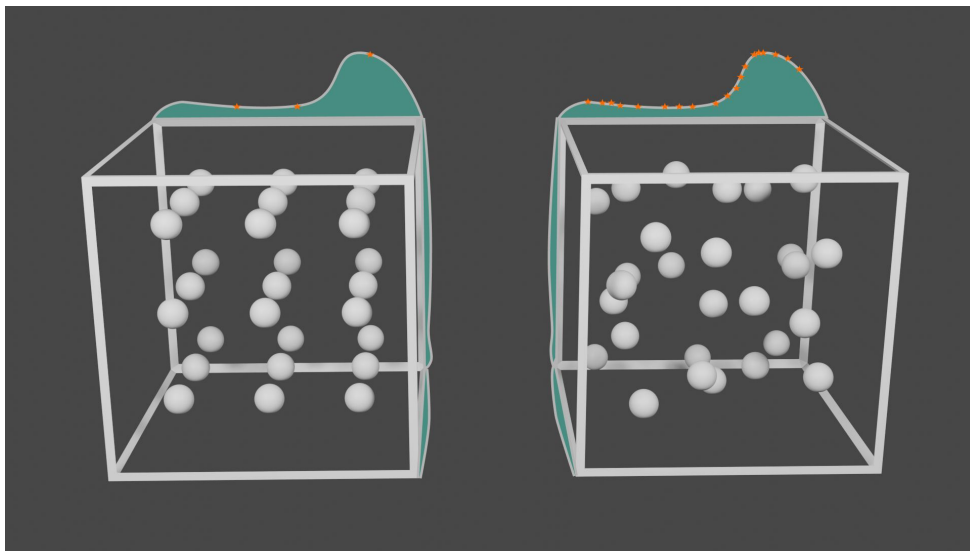
- ❖ Postpone for too long
- ❖ Try to contact the head of a research group

What can you expect from a thesis project in this field?

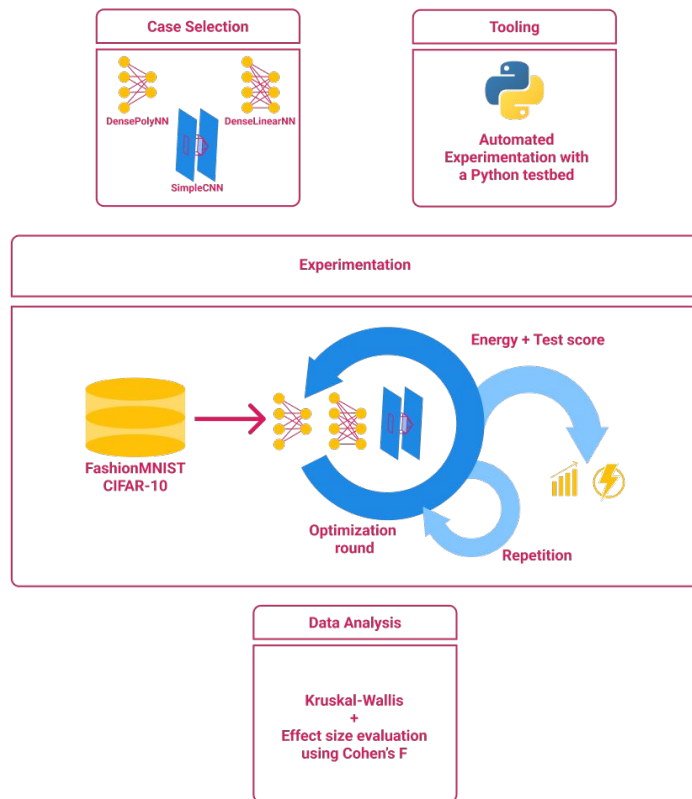
- ❖ Available resources are limited
 - Room for innovation
 - Appreciation for research efforts
- ❖ No concrete end goal
 - Be transparent
 - Keep a good log
- ❖ Great supervision

What am I working on?

- ❖ Random search > Grid search?
- ❖ Design three simple models to train



Methodology



Experiment 1: Hyperparameter Optimization

- ❖ Grid, Random & Bayesian optimization
- ❖ 18,432 training iterations

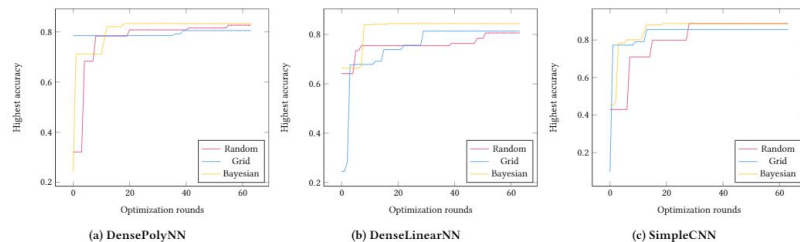


Figure 4: Convergence graphs for the hyperparameter optimization experiment with 5 parameters on the FashionMNIST dataset

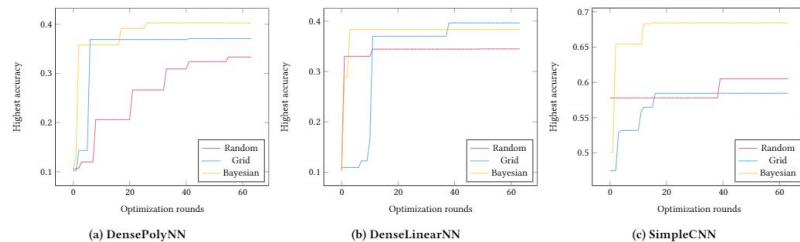


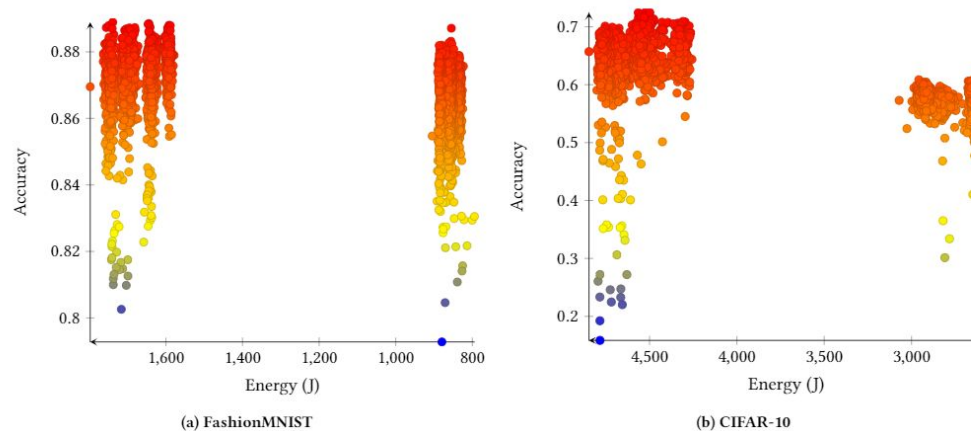
Figure 5: Convergence graphs for the hyperparameter optimization experiment with 5 parameters on the CIFAR-10 dataset

Experiment 2: Network Architecture

Table 2: Relation between model configuration and energy consumption.

Nr.	Lin. layers	Conv. layers	Relu
0	3	1	0
1	3	1	1
2	3	4	0
3	3	4	4
4	7	1	0
5	7	1	1
6	7	4	0
7	7	4	4

Figure 5: Convergence graphs for the hyperparameter optimization experiment with 5 parameters on the CIFAR-10 dataset



ESEC/FSE 2022

- ❖ European Software Engineering Conference and Symposium on the Foundations of Software Engineering
- ❖ A*

Thanks!

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