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EUREKA CLUSTER AI - PROJECT PITCH

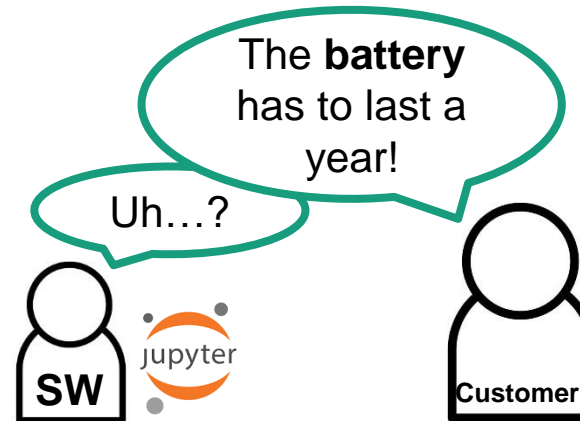
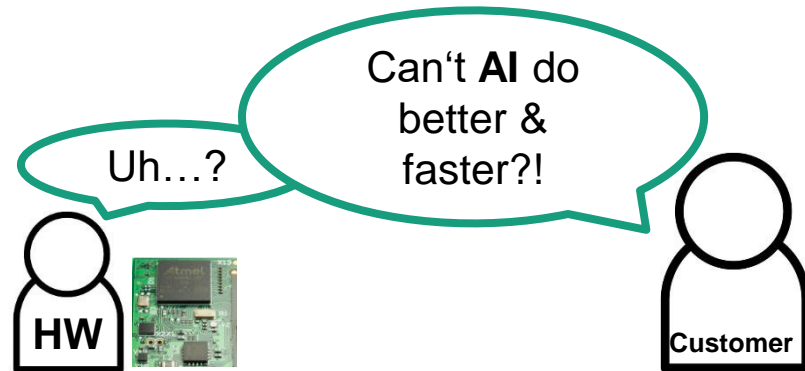
AutoML ASIC – Energy-Aware AutoML for Embedded Systems

Philipp Woller, April 22nd 2021



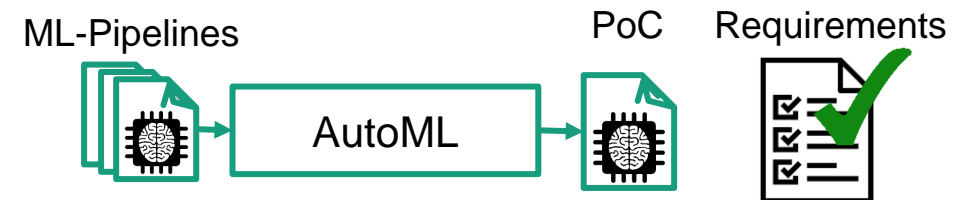
Background and Goal

Problem: Customer requires energy-saving solutions



Our Idea

- Energy Aware AutoML Framework
- **Goal:** Integrated optimization of energy consumption & ML pipeline

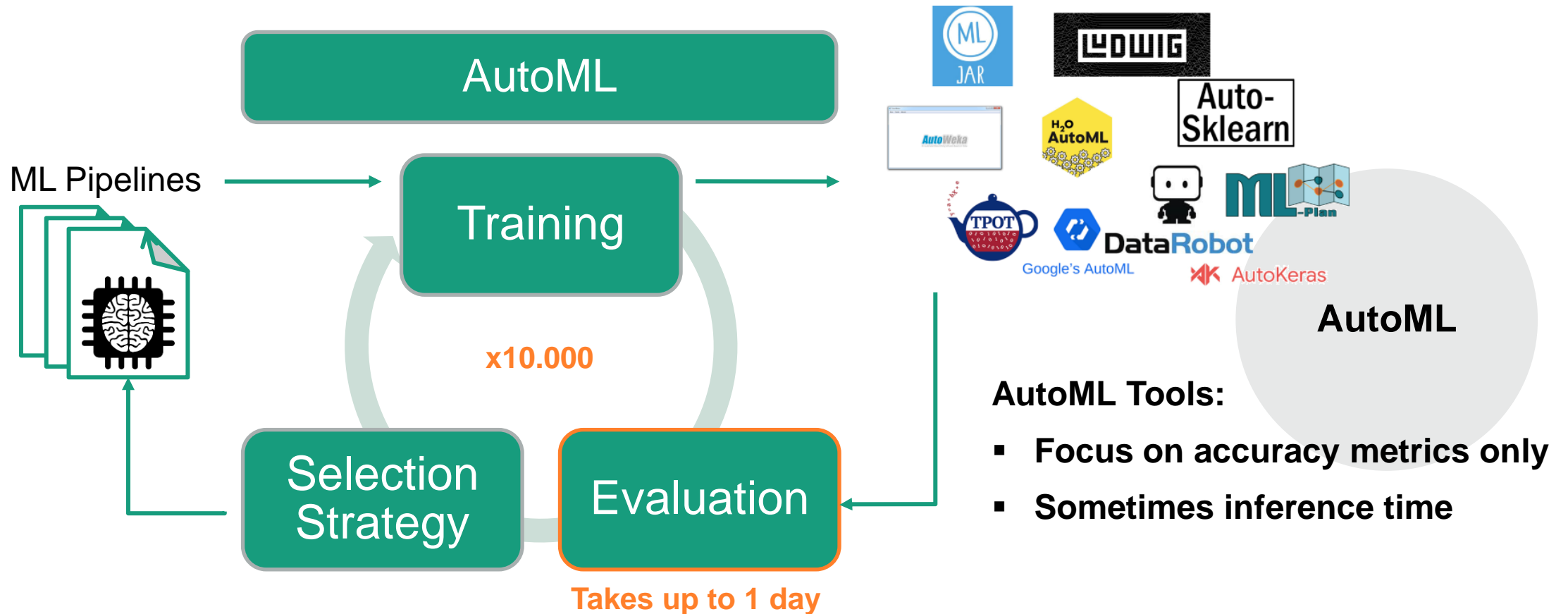


Example Application Fields

- Condition Monitoring (CdM) & Event Detection (classical ML) & ...
- Various hardware platforms

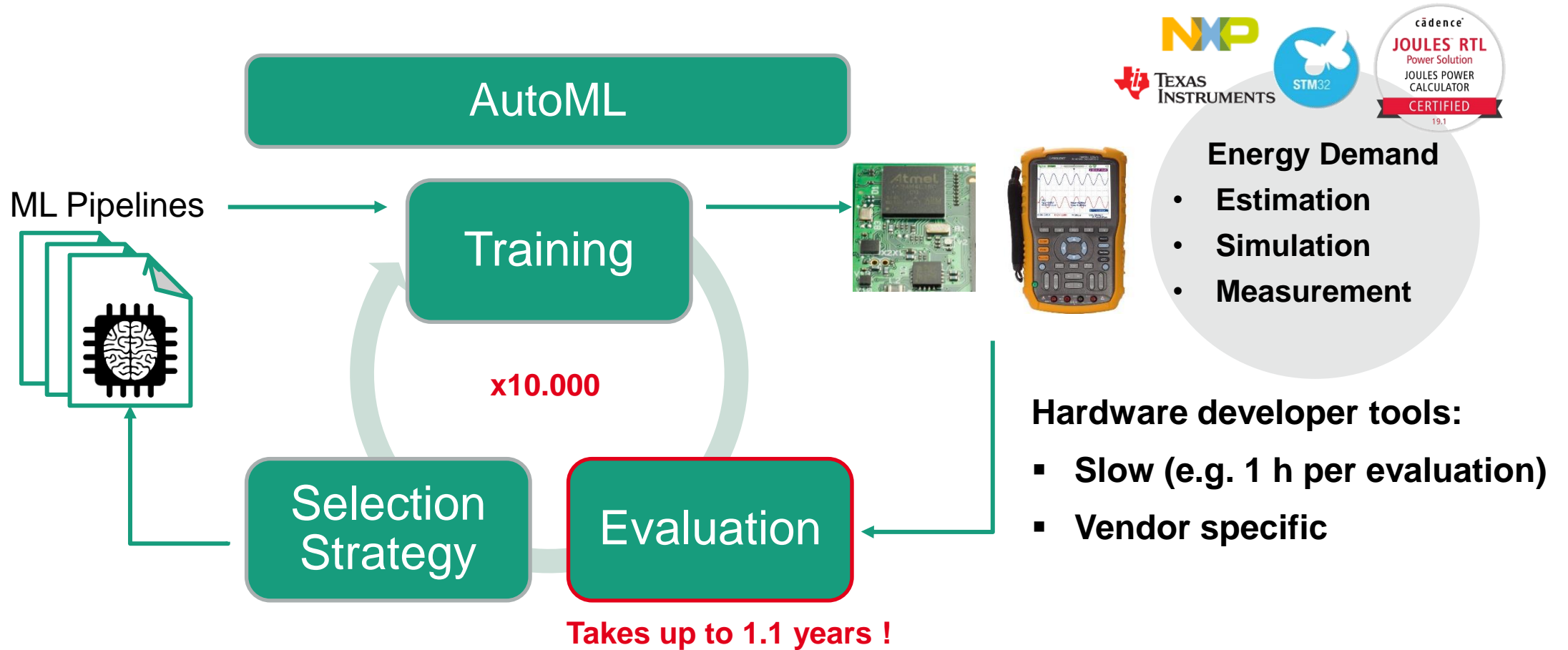
Starting Point – AutoML

Why is this problem difficult to solve?



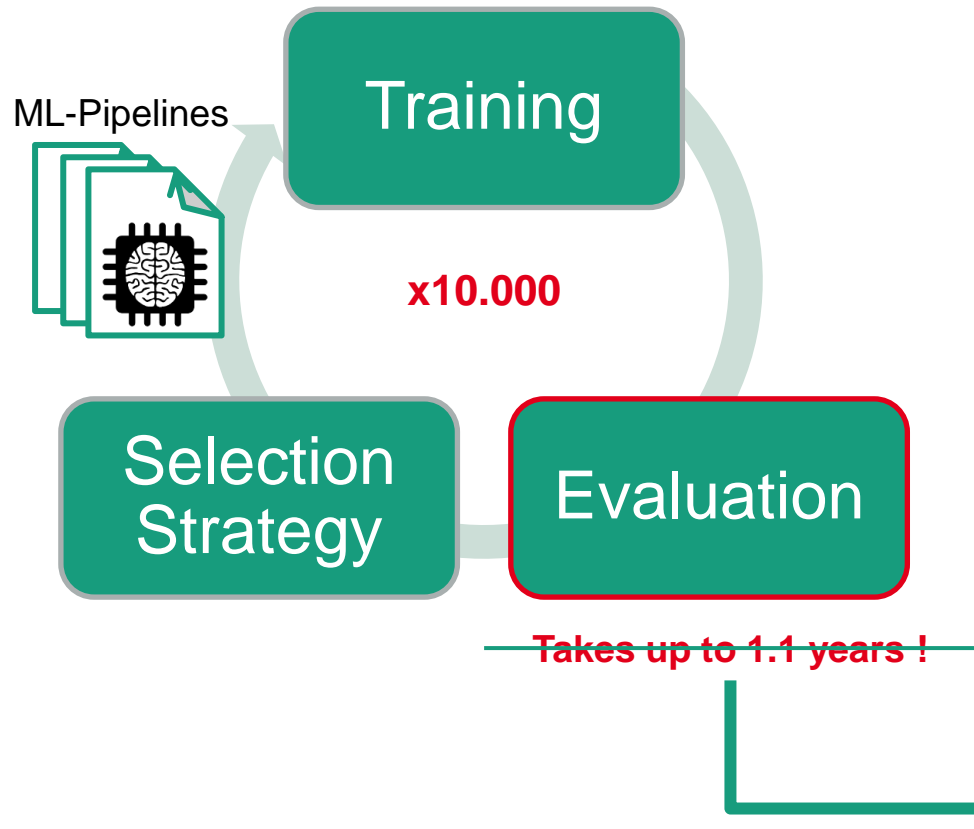
Starting Point – Energy demand

Why is this problem difficult to solve?



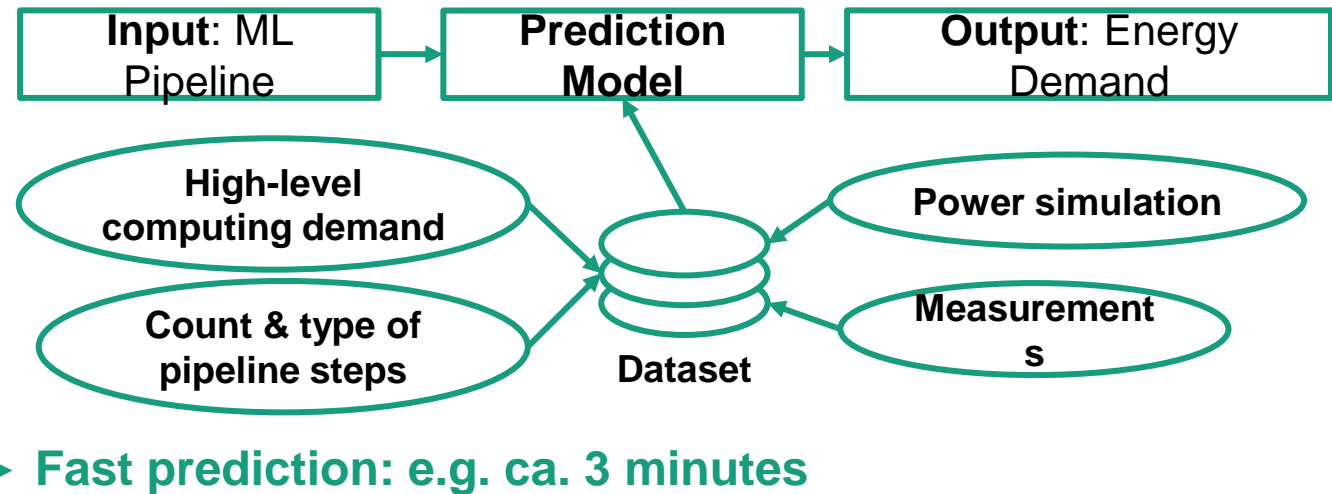
Approach (Idea)

Step 1: Prediction model for energy demand



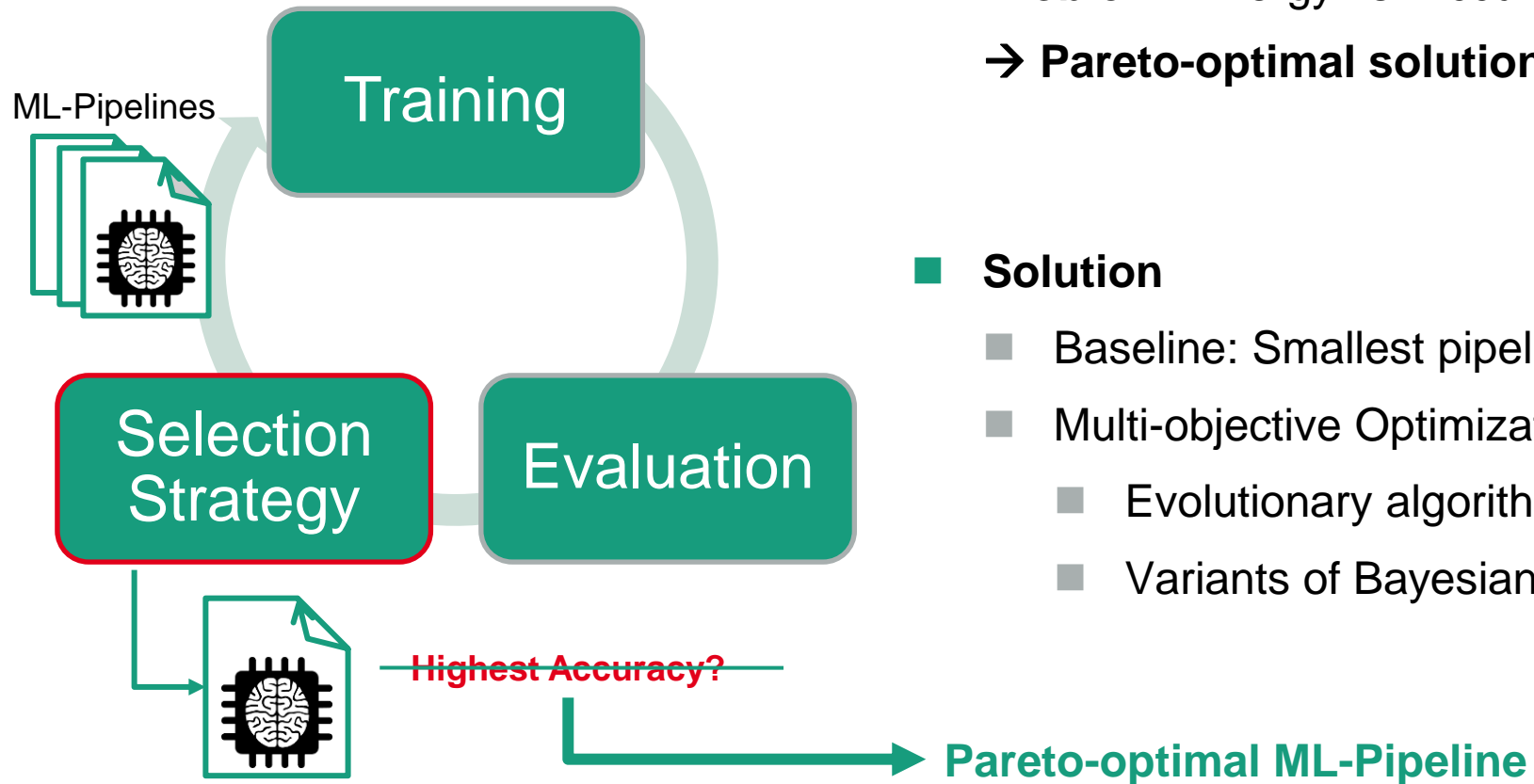
- **Problem:** Simulations & measurements are:
 - time-consuming
 - cost-intensive (licences)

- **Solution:** Prediction model



Approach (Idea)

Step 2: Energy aware selection strategy for AutoML



- **Problem:** Energy vs. Accuracy (multi-objective problem)
→ **Pareto-optimal solution needed**

- **Solution**

- Baseline: Smallest pipeline first
- Multi-objective Optimization
 - Evolutionary algorithms
 - Variants of Bayesian Optimization

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#and you?



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