

# Publication Review - Bao: Making Learned Query Optimization Practical

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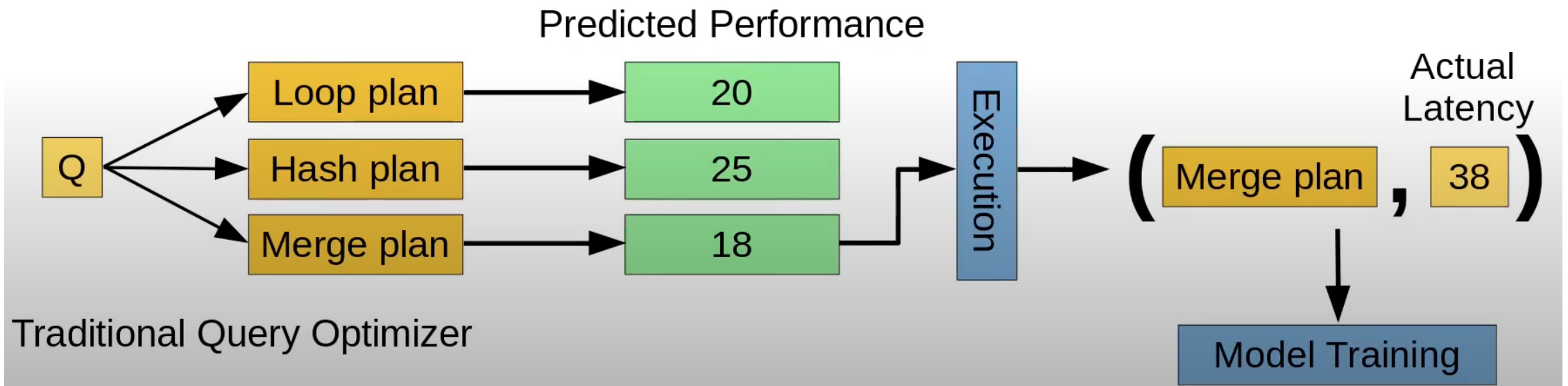
Reviewed for ITEC-6220 by: Firoz Kabir

# Problem Description

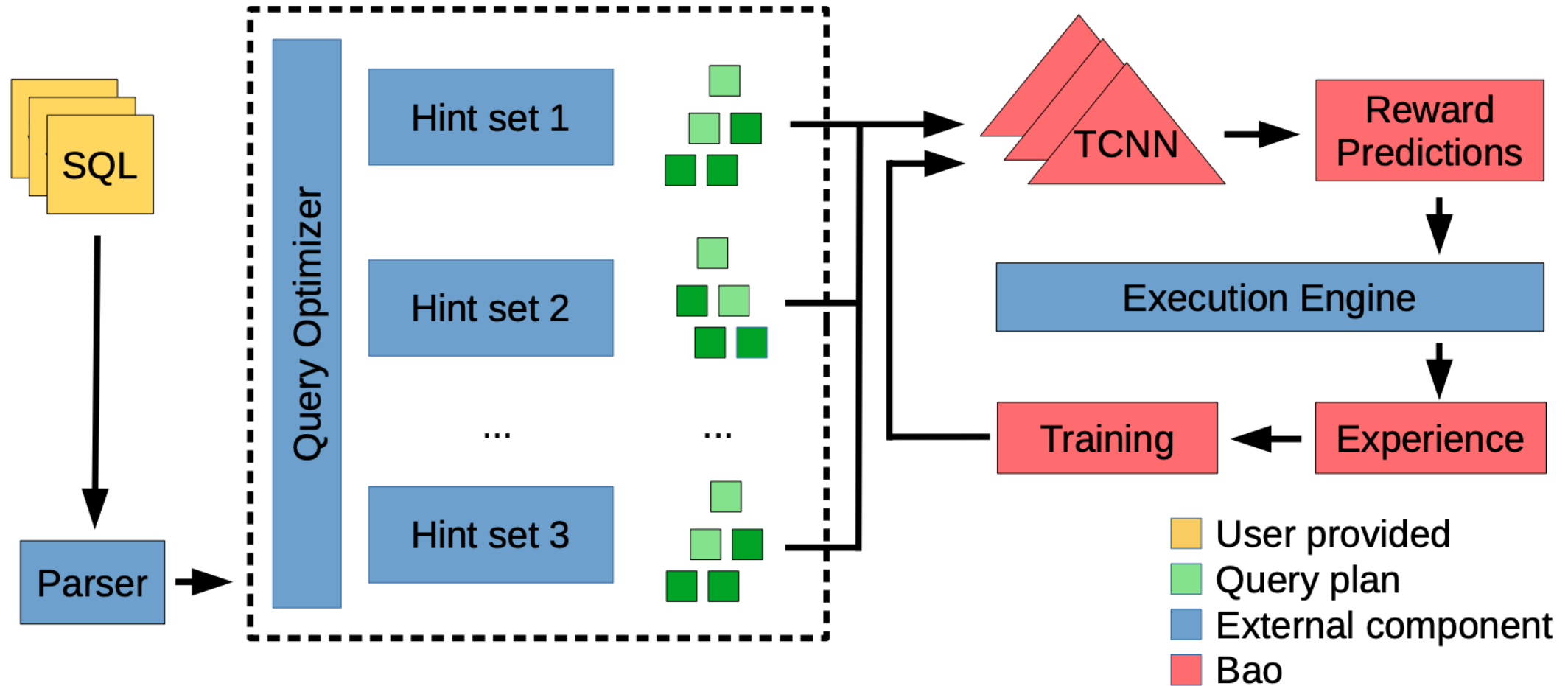
- Long training time
- Inability to adjust to data and workload changes
- Tail catastrophe
- Black-box decisions
- Integration cost

# The Bao difference:

- Short training time
- Robustness to schema, data, and workload changes
- Better tail latency
- Interpretability and easier debugging
- Low integration cost
- Extensibility

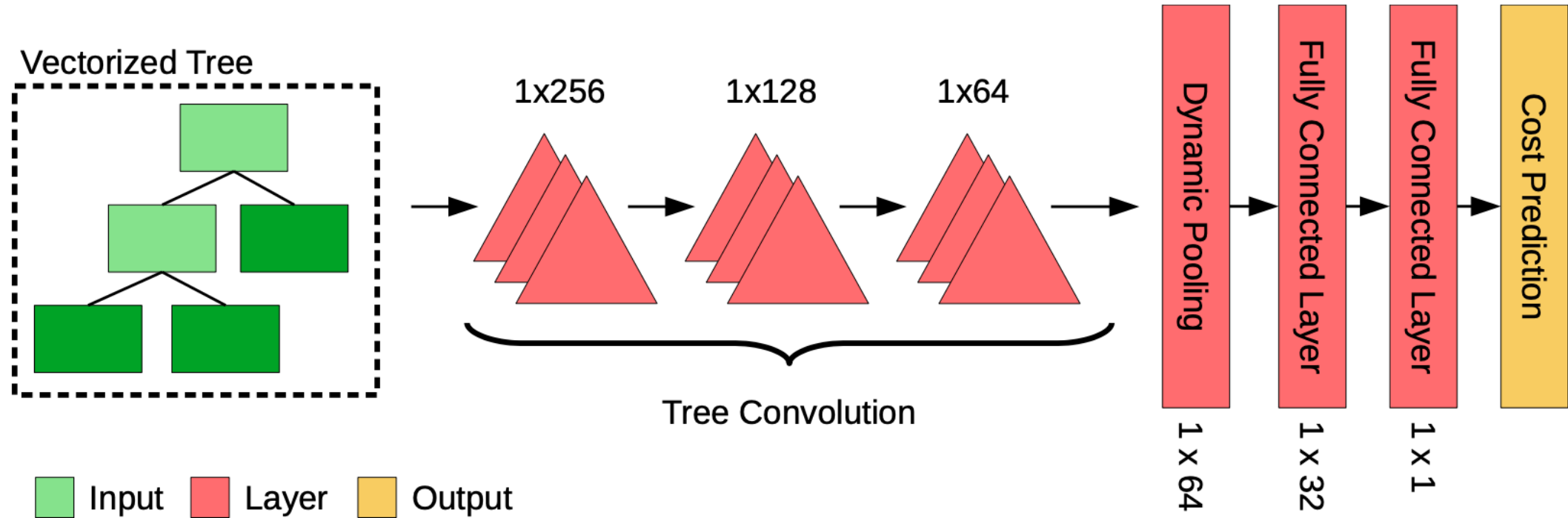


# Bao System Model:

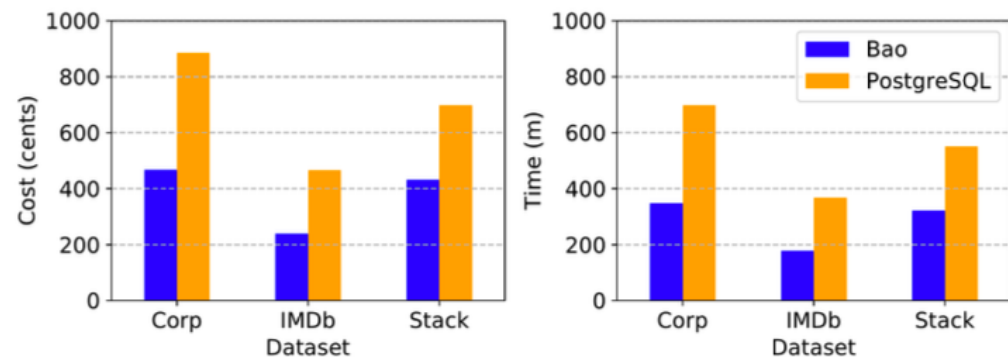


**Figure 2: Bao system model**

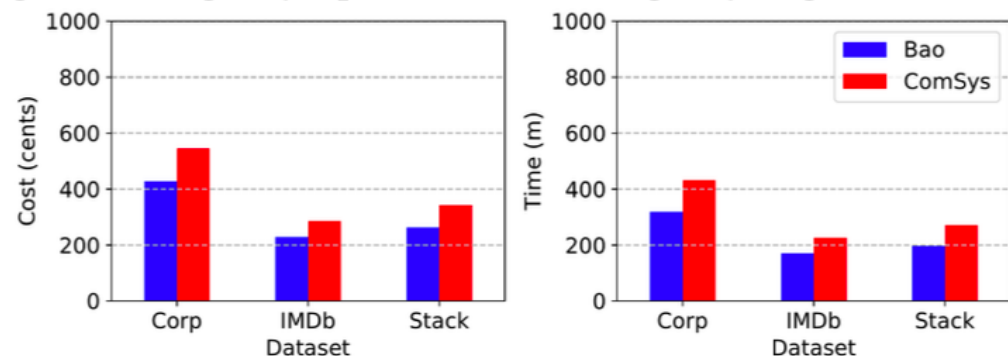
# Bao Prediction Model:



**Figure 5: Bao prediction model architecture**

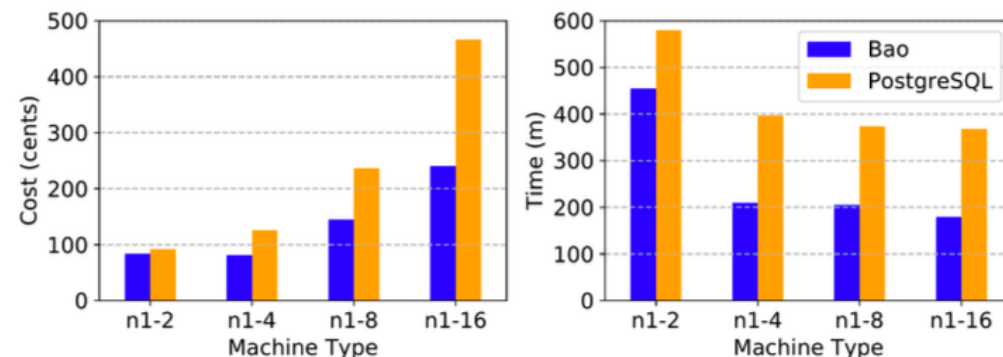


(a) Across our three evaluation datasets, Bao on the PostgreSQL engine vs. PostgreSQL optimizer on the PostgreSQL engine.

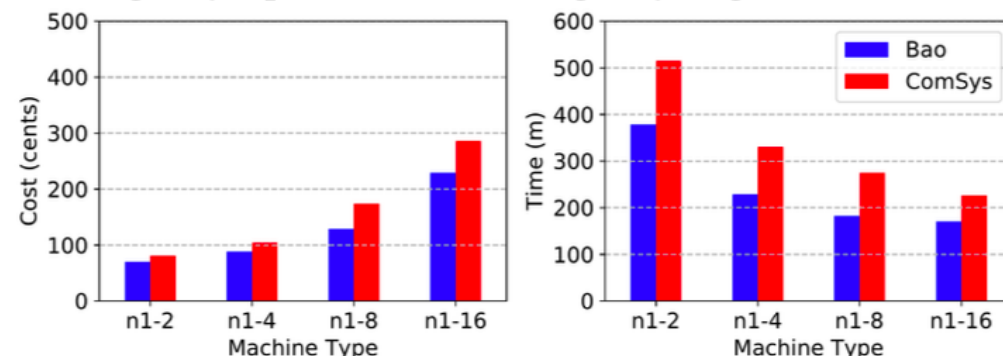


(b) Across our three evaluation datasets, Bao on the ComSys engine vs. ComSys optimizer on the ComSys engine.

Figure 7: Cost (left) and workload latency (right) for Bao and two traditional query optimizers across three different workloads on a N1-16 Google Cloud VM.



(a) Across four different VM types, Bao on the PostgreSQL engine vs. PostgreSQL optimizer on the PostgreSQL engine.



(b) Across four different VM types, Bao on the ComSys engine vs. ComSys optimizer on the ComSys engine.

Figure 8: Cost (left) and workload latency (right) for Bao and two traditional query optimizers across four different Google Cloud Platform VM sizes for the IMDb workload.

Questions ?