



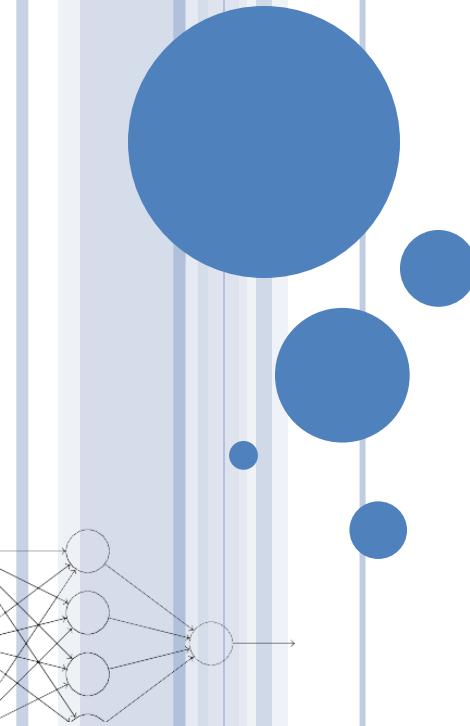
ACTIVE LEARNING ON A BUDGET: OPPOSITE STRATEGIES SUIT HIGH AND LOW BUDGETS

Guy Hacohen^{1,2,}, Avihu Dekel^{1,*}, Daphna Weinshall¹*

* Equal contribution

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The Hebrew University of Jerusalem

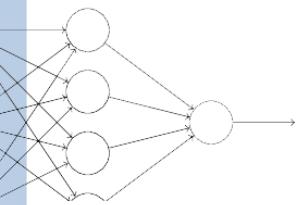
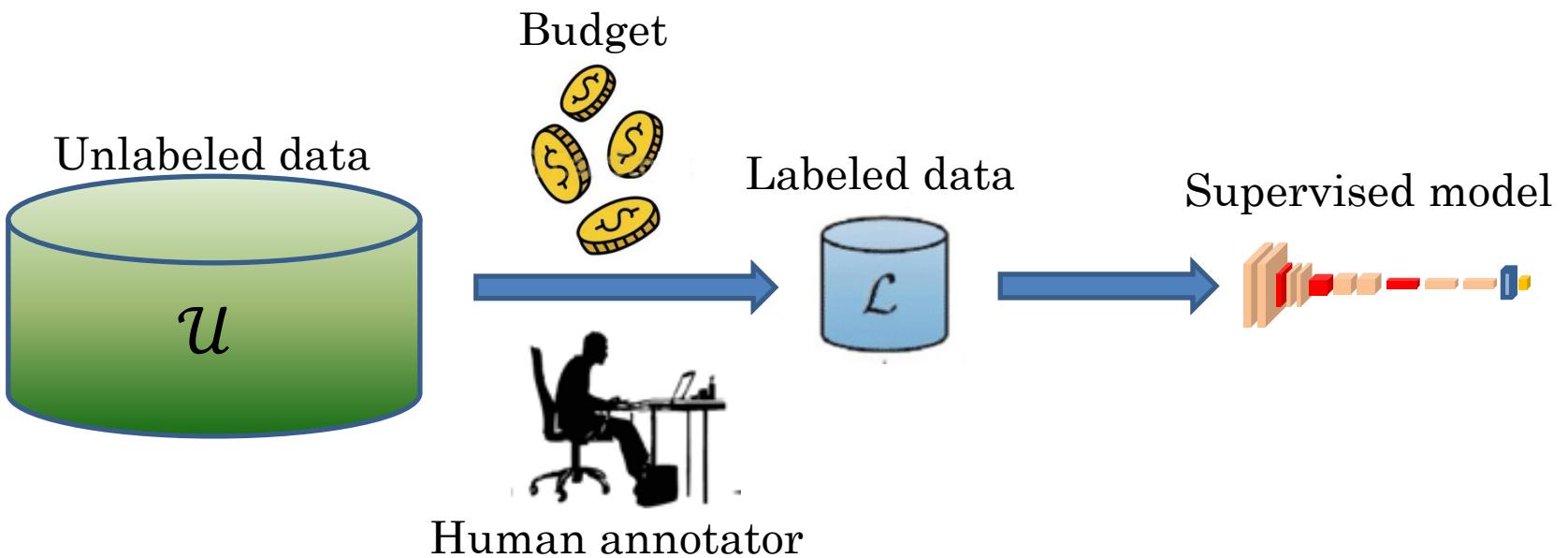
²Edmond and Lily Safra center for brain sciences (ELSC)
The Hebrew University of Jerusalem





BACKGROUND – ACTIVE LEARNING

- Budget (B) – number of examples to label
- Pick B examples for annotation, which most benefit the model





LOW-BUDGET VS HIGH-BUDGET

- Different budgets – opposite strategies

High budget

Many labeled examples



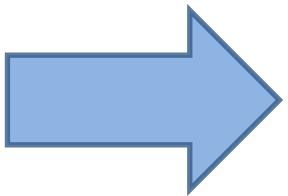


LOW-BUDGET VS HIGH-BUDGET

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High budget

Many labeled examples



Uncertainty sampling

Focus on atypical examples



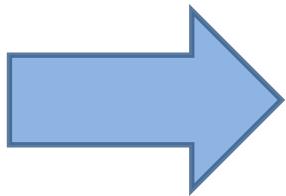


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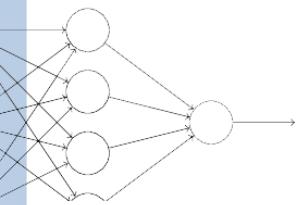
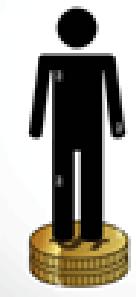
Uncertainty sampling

Focus on atypical examples



Low budget

Few labeled examples



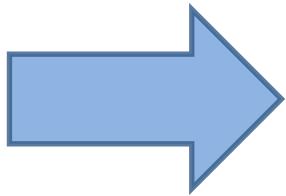


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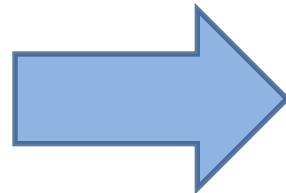
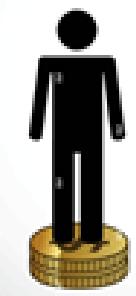
Uncertainty sampling

Focus on atypical examples



Low budget

Few labeled examples



Typical clustering

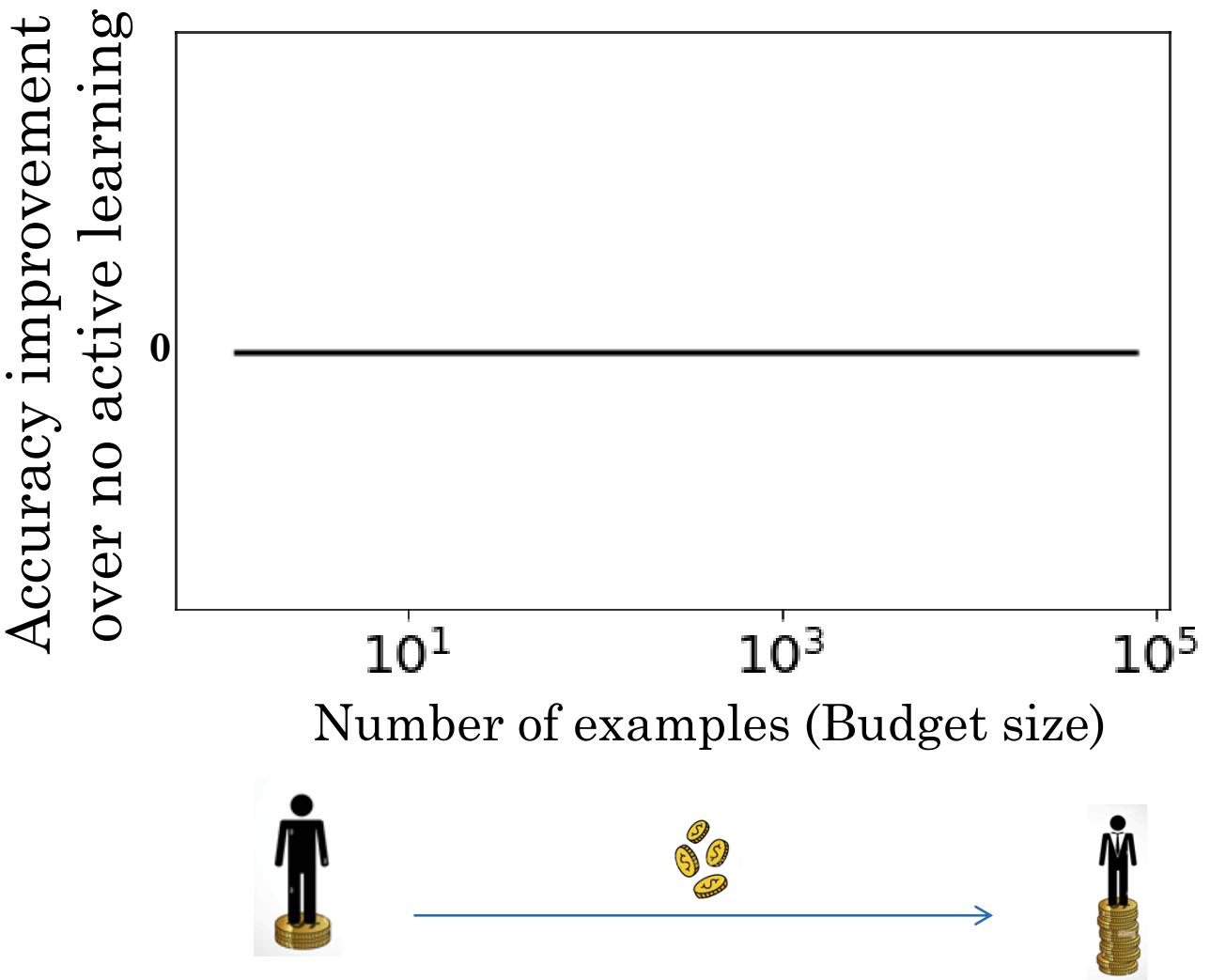
Focus on typical examples





PHASE TRANSITION - THEORY

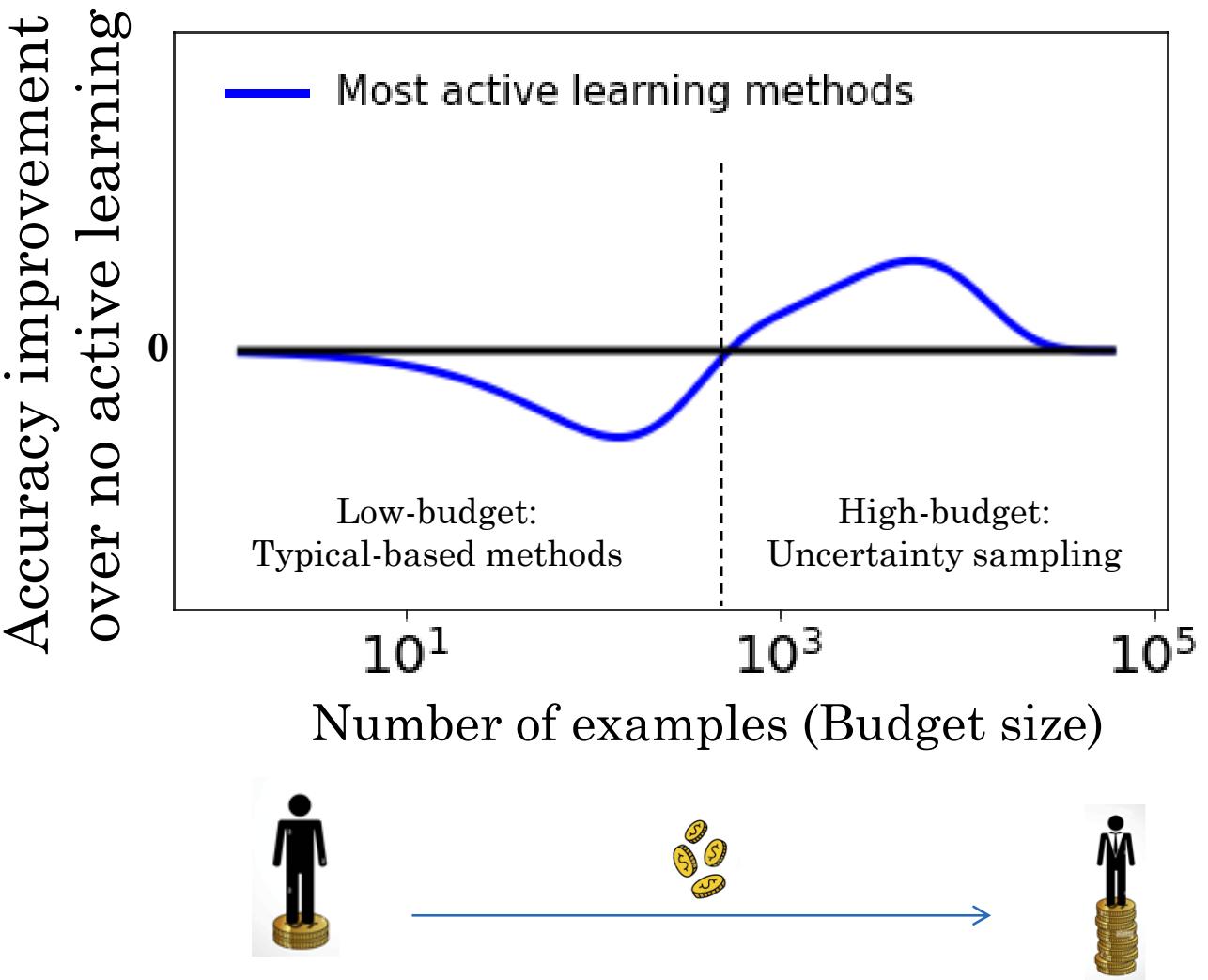
- Different budgets – opposite strategies





PHASE TRANSITION - THEORY

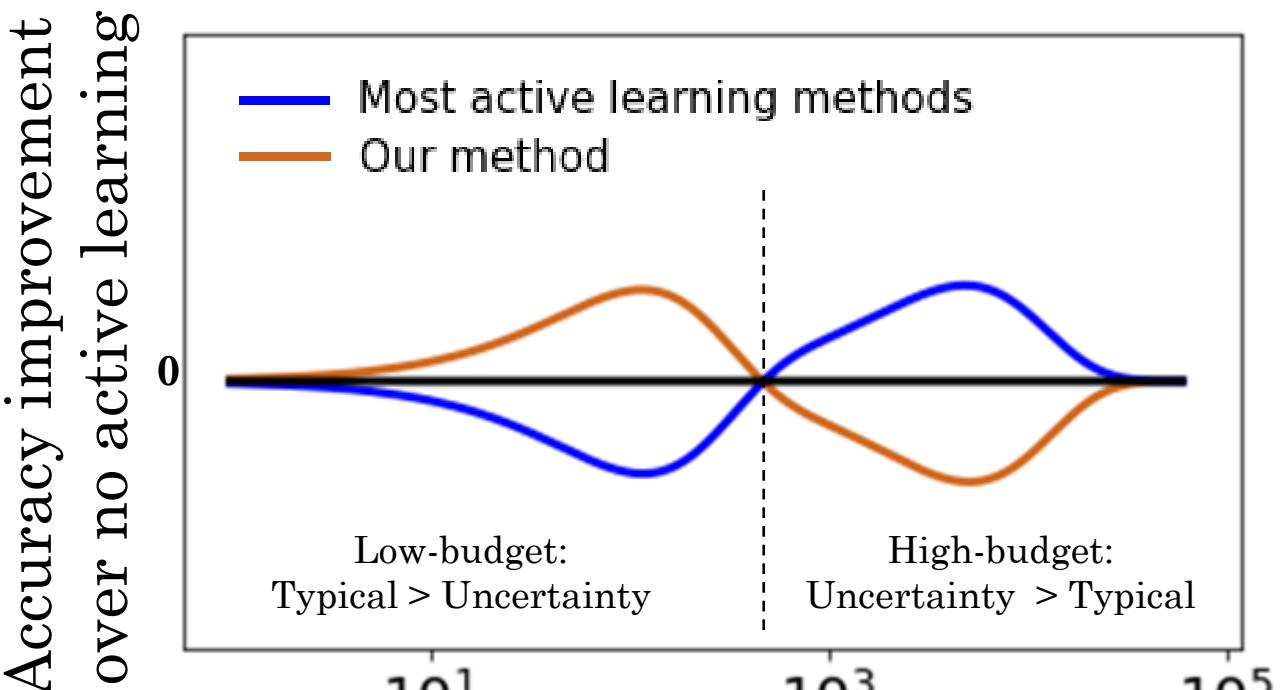
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PHASE TRANSITION - THEORY

- Different budgets – opposite strategies



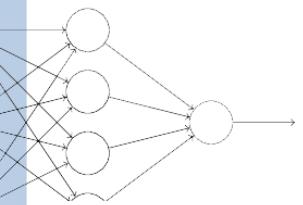
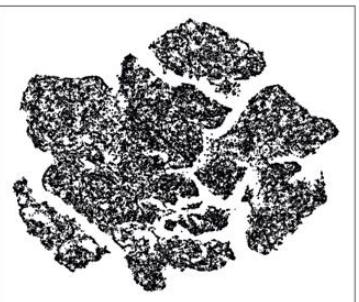


OUR METHOD: TYPICAL CLUSTERING

- Query diverse and typical examples

Unsupervised
Representation
learning

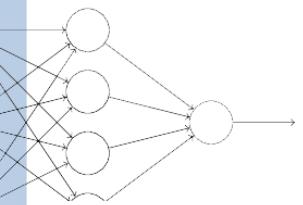
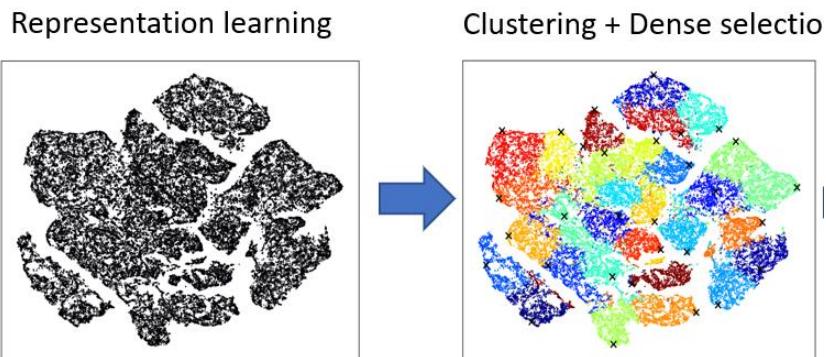
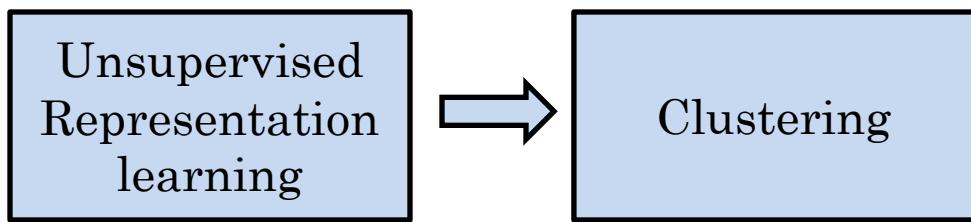
Representation learning





OUR METHOD: TYPICAL CLUSTERING

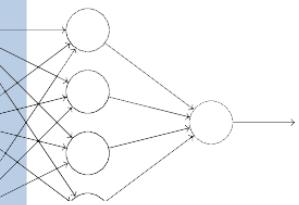
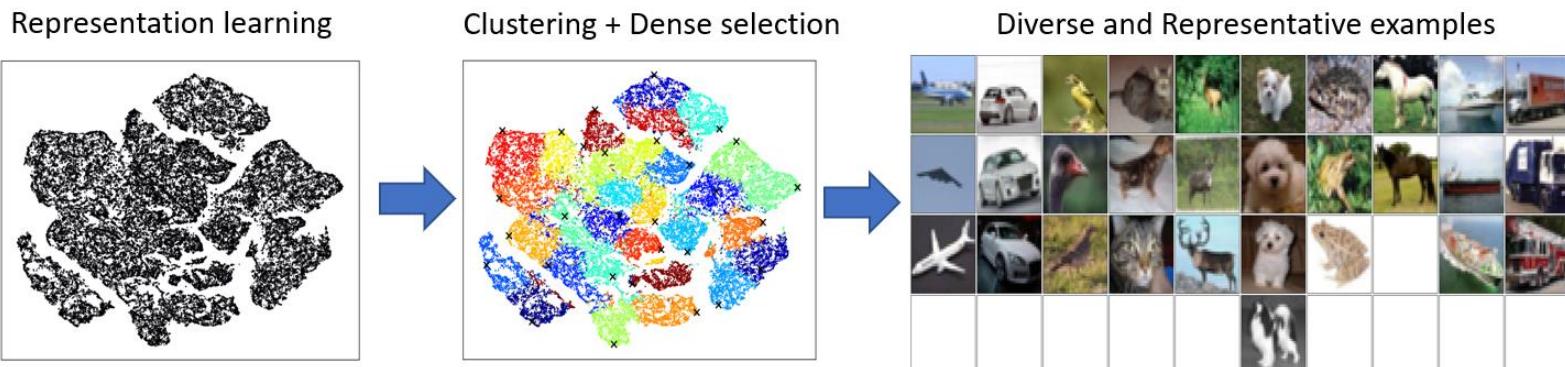
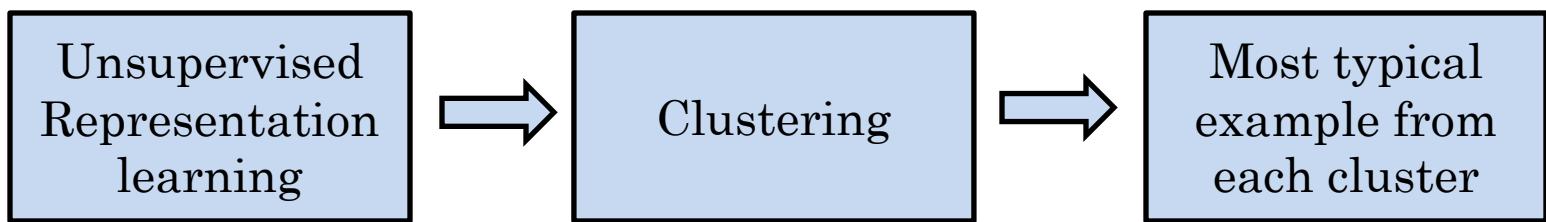
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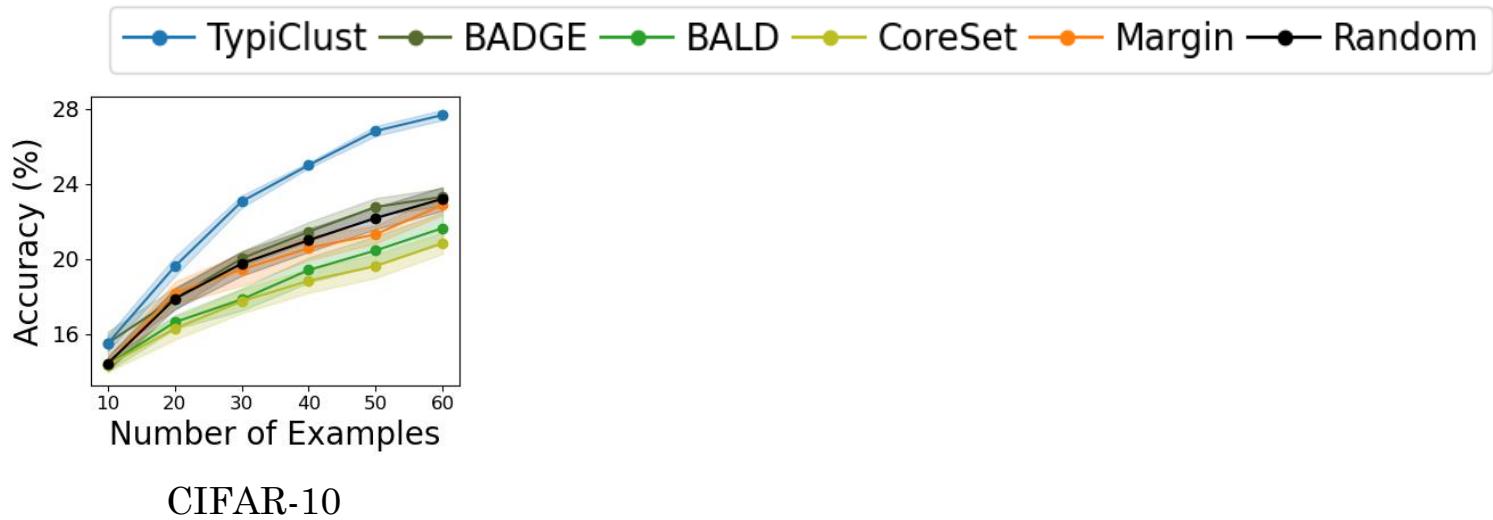
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RESULTS

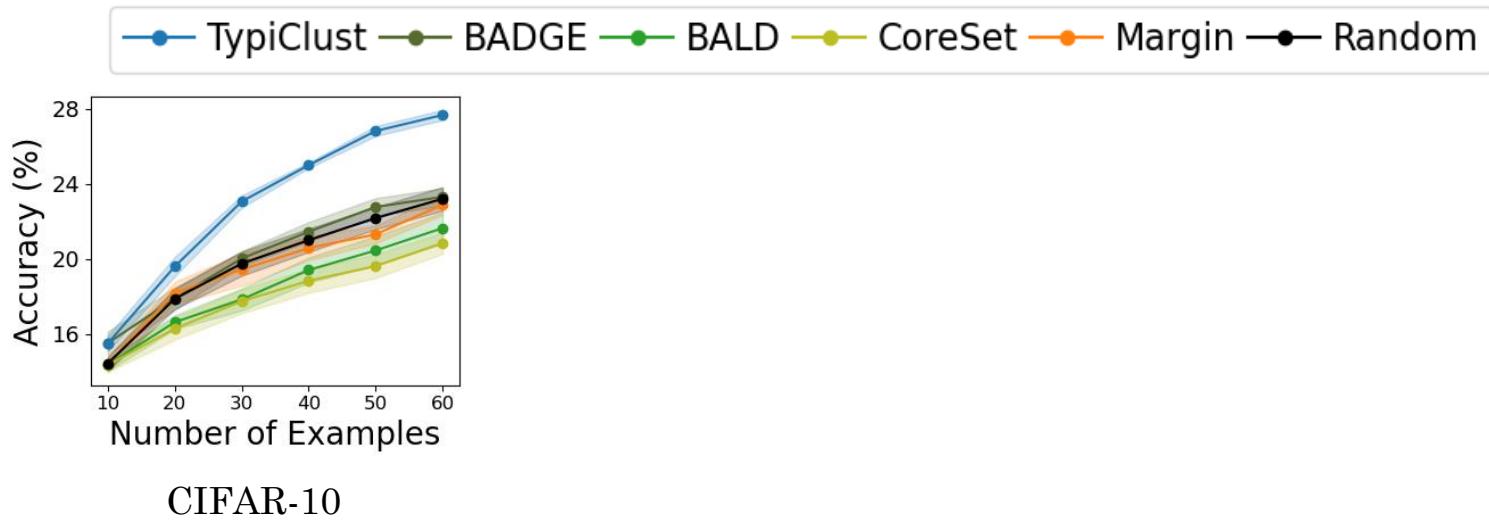
- Greatly improves active learning in low budgets





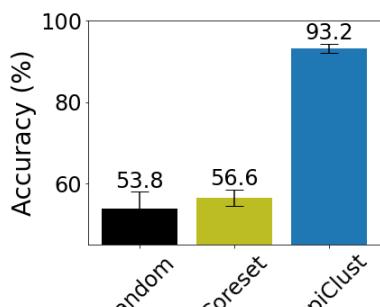
RESULTS

- Greatly improves active learning in low budgets



CIFAR-10

- Major improvements of SOTA semi-supervised methods

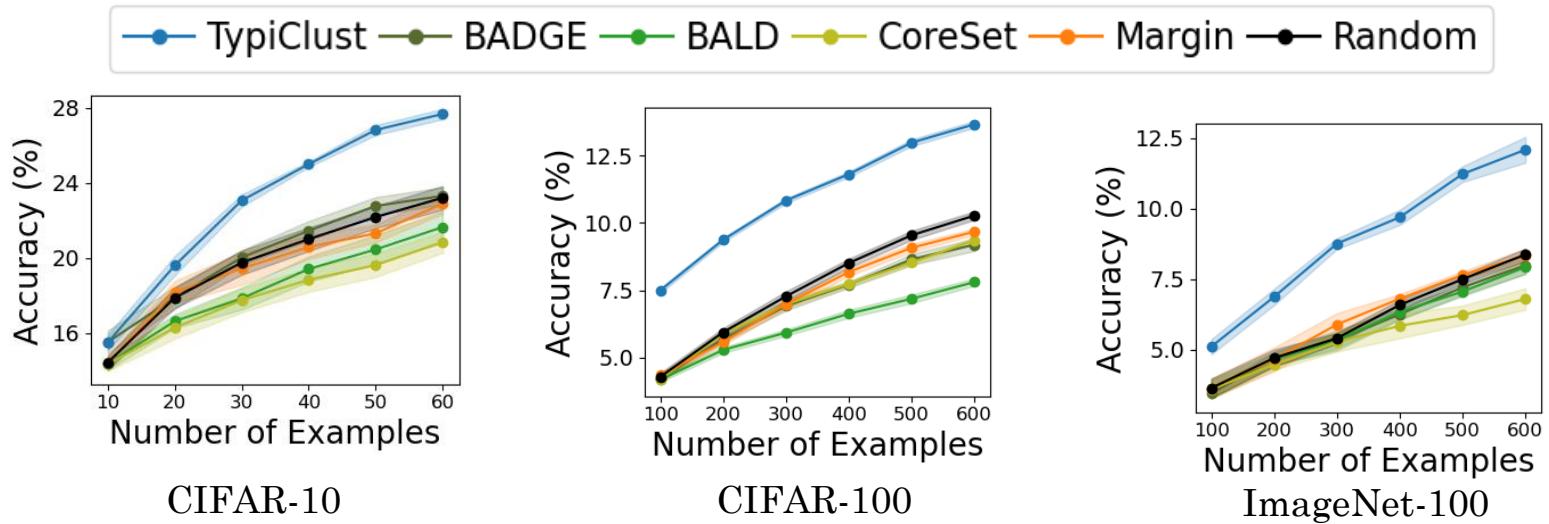


CIFAR-10

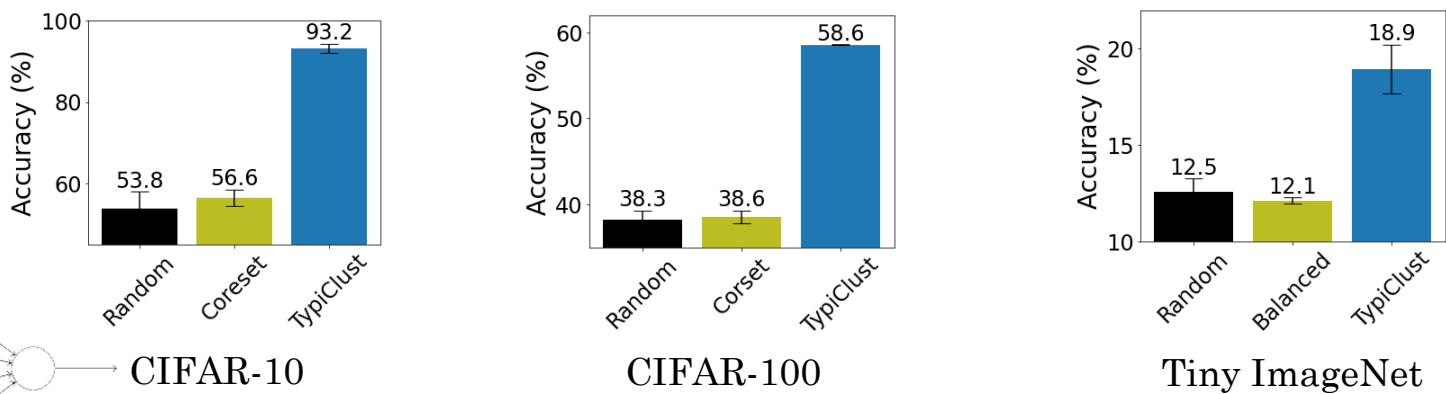


RESULTS

- Greatly improves active learning in low budgets



- Major improvements of SOTA semi-supervised methods



**FOR MORE DETAILS, COME VISIT OUR
POSTER!**

Thank you!

Paper:



Blog post and code:

