

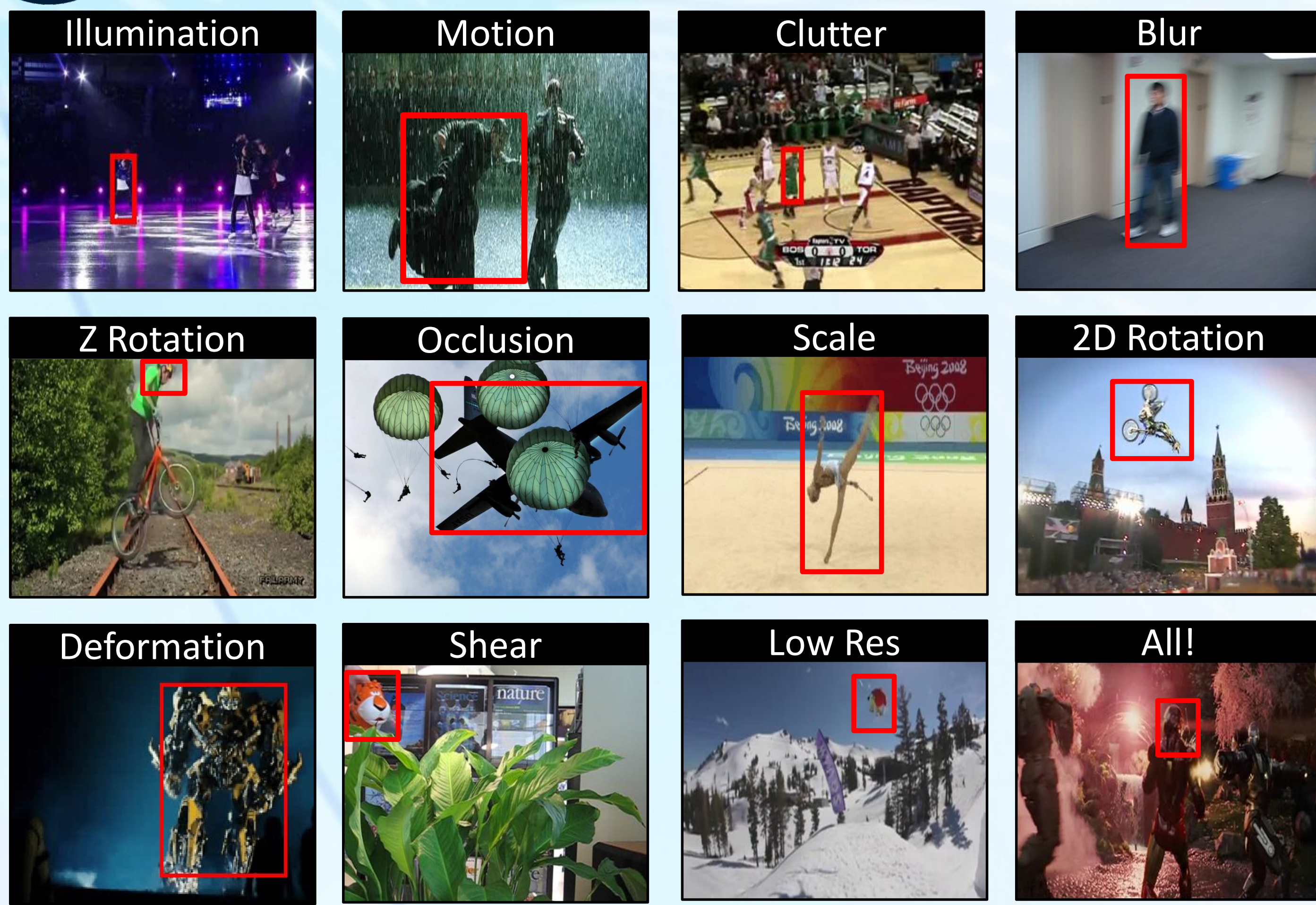
ROBUST DISCRIMINATIVE VISUAL TRACKING VIA ACTIVE LEARNING

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1 INTRODUCTION

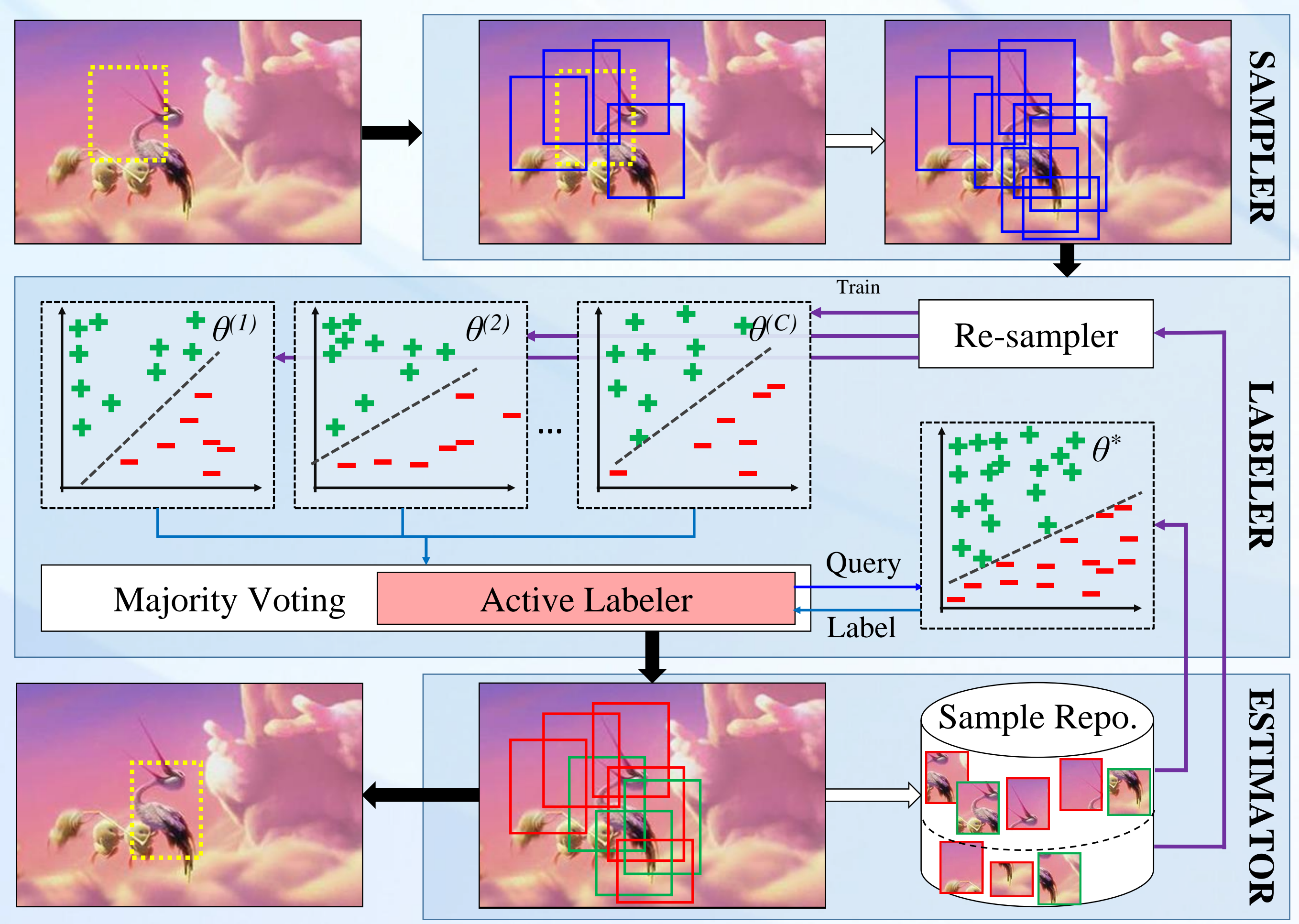
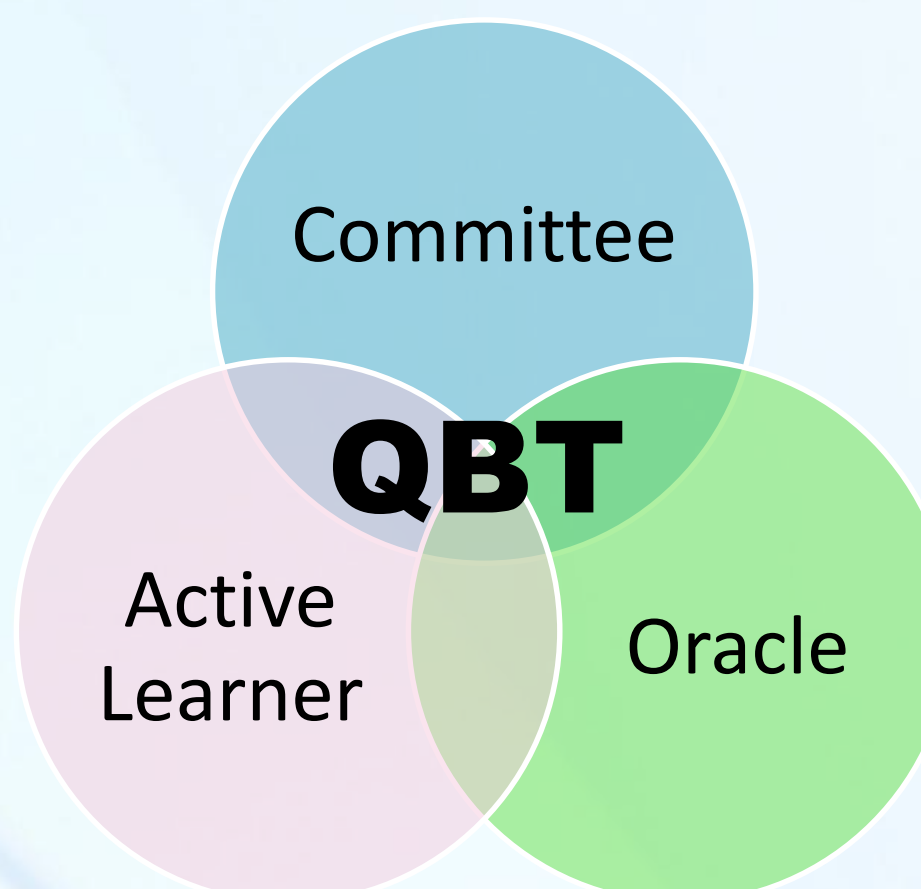
Adaptive tracking-by-detection approaches treat tracking as a classification task and constantly update the object model. The update procedure requires a set of labeled examples, where samples are collected from the last observation, and then labeled. However, these intermediate steps typically follow a set of heuristic rules for labeling and uninformed search in the sample space, which decrease the effectiveness of model update. In this study, we present a framework for adaptive tracking that utilizes active learning for effective sample selection and labeling them. The active sampler employs a committee of randomized-classifiers to select the most informative samples and query their label from an auxiliary detector with a long-term memory. The committee is then updated with the obtained labels.

2 CHALLENGES



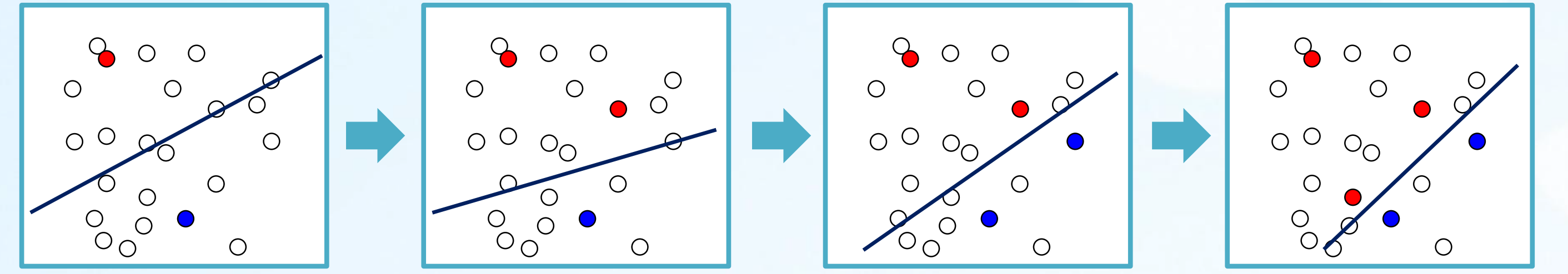
3 QBT ALGORITHM

- ✓ A committee of randomized detectors
- ✓ An oracle with long-term memory
- ✓ Active learning scheme (modified query-by-bagging) for update and co-learning
- ✓ Adaptive sampling
- ✓ Faithful target state approximation



4 ACTIVE LEARNING

In active learning the learner interactively chooses which data points to label.

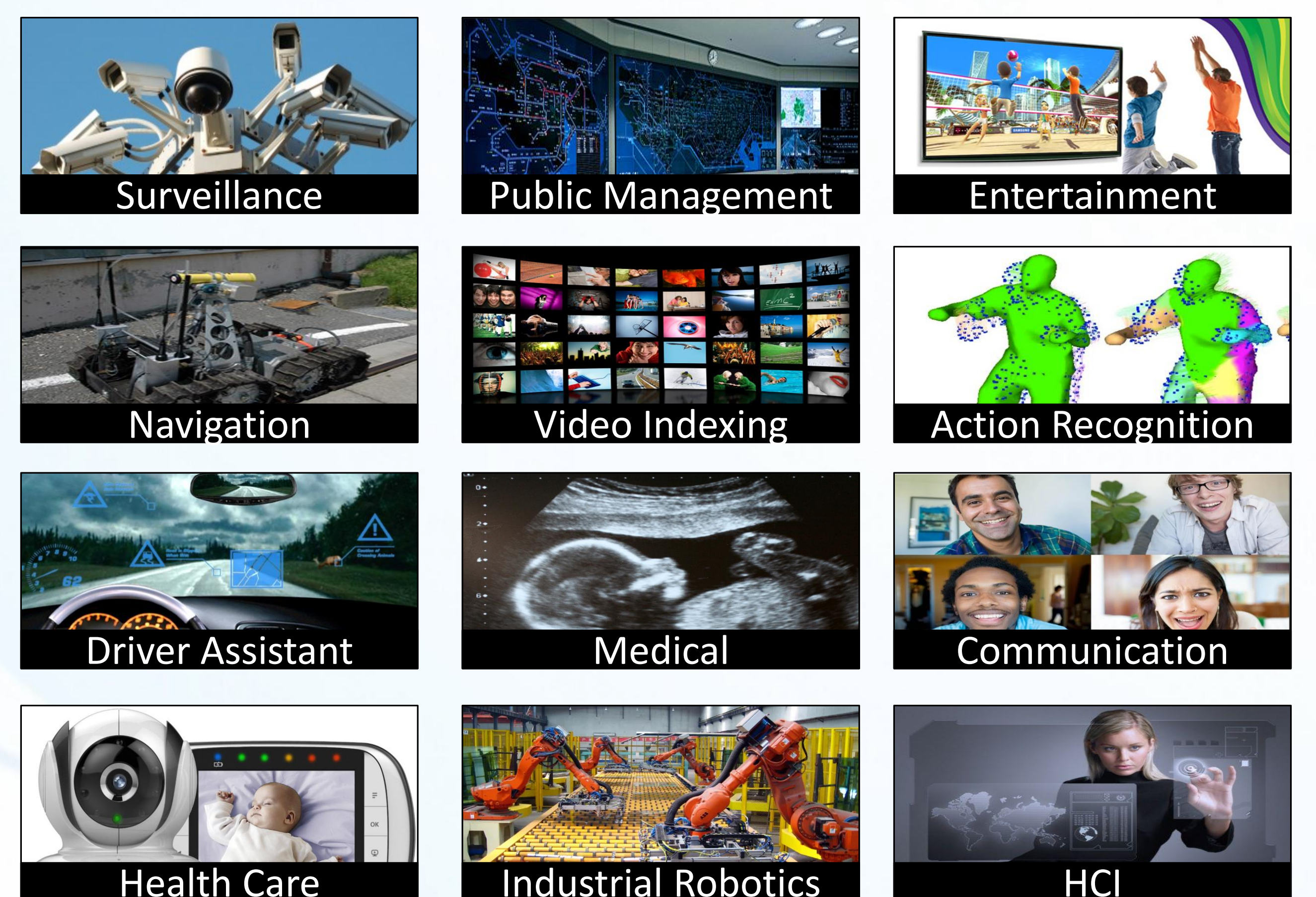


5 RESULTS



- ✓ Accurate (Comparable with state-of-the-art)
- ✓ Reliable (Graceful degradation)
- ✓ Real-time Processing (> 24 fps)
- ✓ Robust (High performance under various challenges)
- ✓ Compatible with Embedded Systems

6 APPLICATIONS



7 REFERENCES

- K. Meshgi, S. Oba, and S. Ishii, "Robust Discriminative Tracking via Query-by-Bagging," AVSS'16, Colorado, USA, 2016.
- K. Meshgi, S. Oba, S. Ishii, "Active Discriminative Tracking using Collective Memory," in Proc. of MVA'17, IEEE, Tokyo, Japan, 2017.

