TAILOR: Teaching with Active and Incremental Learning for Object Registration

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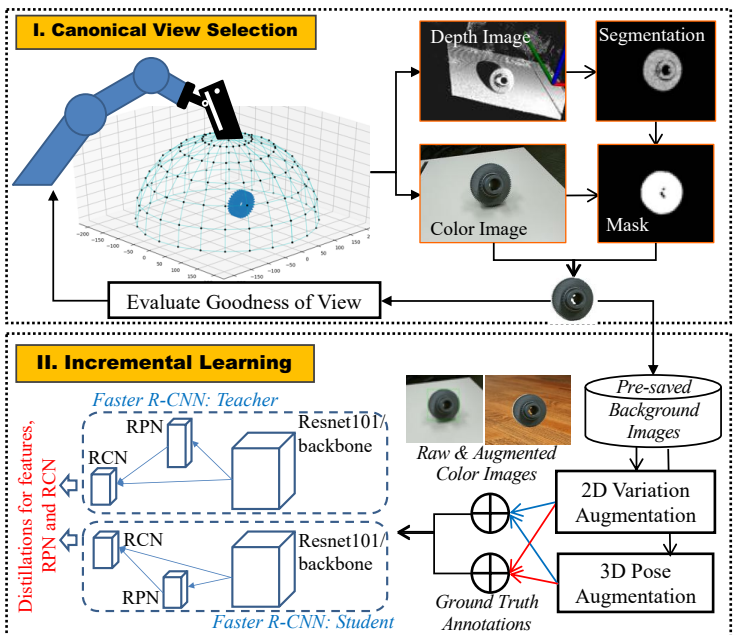
MOTIVATION

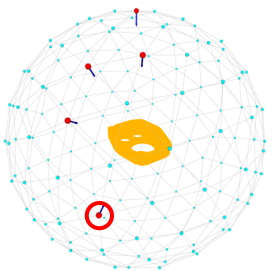
To enable fast object registration through **active** and **incremental** learning from few data samples

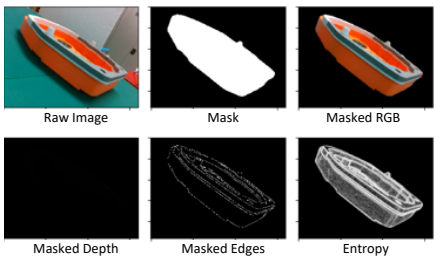
METHOD



SYSTEM

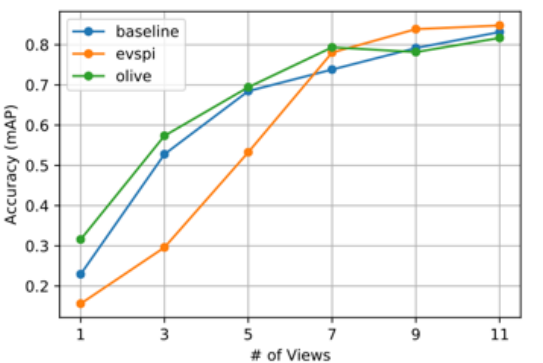
KUKA LBR iiwa 14 R820 (7-DOF) RealSense D435 → Sample selection on 88 pre-defined viewpoints → Online GOV evaluation on basic visual features





BENCHMARK EVALUATION

- Applied on registration of industrial objects, i.e., up-to 10 gear box components, each using less than 5 views
- For each object, sampling in 3 minutes + 30 minutes for training
- Achieving average mAP of >0.90
- Our method (OLIVE [1]) selects more informative viewpoints than random and EVSPI [2] based on evaluation on T-LESS public dataset [3].



[1] Xu et al. 2020. Active image sampling on canonical views for novel object detection. In *ICIP'20*.
[2] Gao et al. 2016. Efficient view selection by measuring proxy information. *J. Vis. Comput. Animation* 27: 351–357.
[3] Hodan et al. 2017. T-LESS: An RGB- D Dataset for 6D Pose Estimation of Texture-Less Objects. *2017 IEEE WACV*.

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