Problem with current approaches

- Doesn’t exploit the variation in appearance across progressive viewpoints which can be used for an initial estimation.
- Expensive in terms of memory and Computation

Objective

- Coarsely localize a workpiece based on its CAD data.
- Provide initial estimate to Fine Localization module for further pose precision

Probabilistic model of localization

to update the location after every observation

\[ P(pos|obs) = \frac{P(obs|pos)\times P(pos)}{P(obs)} \]

Approach

High level Feature Extraction:
- faster computation for a coarse estimate (wide domains) with high certainty in a trade off with a fine estimate (narrow domain with low certainty).

Clustering:
- Gaussian Mixture Model (GMM):
  - soft association of views to clusters.
  - provides a probabilistic distribution that indicates the certainty of the clustering.
- Mean Shift model:
  - finds the number of clusters it on its own.

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