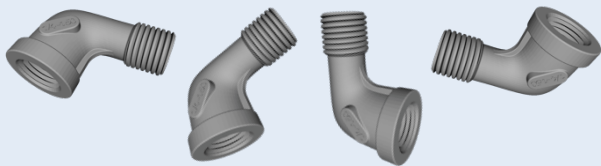


Training

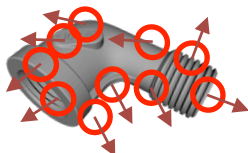


Training instances

The training instances have unknown poses. No parts are predefined in the dataset.

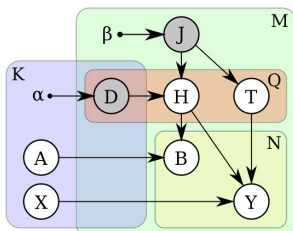
Shape feature extraction

Pose invariant descriptors are extracted from 3D shape-based interest points

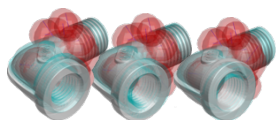


Particle-based EM algorithm

The appearance and shape of an object class, \mathbf{A} and \mathbf{X} , are learned. Object poses \mathbf{T} are also inferred simultaneously.



Registration



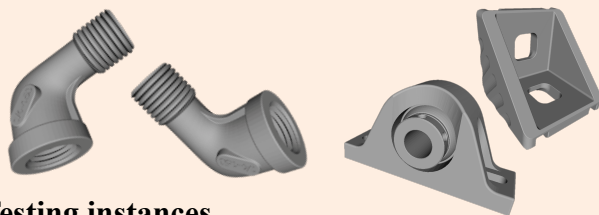
Training instances are registered to a reference frame.

The SAP model

It describes the shape (\mathbf{X}) and appearance (\mathbf{A}) of an object class in a reference frame.



Testing

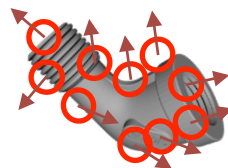


Testing instances

The testing instances have unknown poses and class labels.

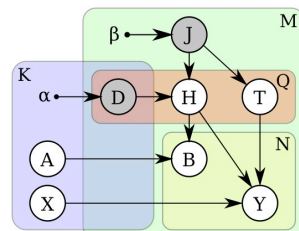
Shape feature extraction

Pose invariant descriptors are extracted from 3D shape-based interest points

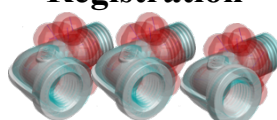


Particle-based EM algorithm

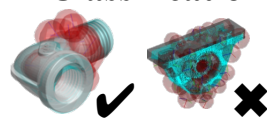
Given \mathbf{X} and \mathbf{A} , poses of testing instances \mathbf{T} are inferred.



Registration



Classification



Registration and classification are performed using the SAP model.

The SAP Model