Handling geometrical symmetries of textureless objects is an important aspect of learning based pose estimation. Special means have to be employed in order not to hinder the network’s convergence when dealing with objects exhibiting planes or axes of symmetry. A plethora of pose estimation methods propose different solutions [1]–[5]. Yet, usually an unbiased comparison of these methods is missing since being performed with different network architectures, metrics and training data.

The aim of this work is to implement and test the leading approaches on common ground. Choose an object pose estimation approach as basis and extend it to handle symmetries in different ways. Evaluate and compare these symmetry handling strategies. Produce an unbiased rating of these approaches with respect to aspects such as performance, usability and training and test time. Improve or combine the most promising approaches in one of the evaluated aspects.

Tasks

- Perform a review of the state of the art for object pose estimation and object symmetry handling.
- Obtain or implement the leading approaches for symmetry handling for a relevant pose estimator.
- Show the individual benefits and shortcomings by evaluating on performance, usability and applicability.
- Excel the state of the art in some aspect.

Workload split

- Research and theory: 30%
- Programming and implementation: 50%
- Writing: 20%

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References


plaining the ambiguity of object detection and 6d pose from visual data,” in Proceedings of the