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Conclusions

In this work, several applications were demonstrated to estimate range and to classify special points of interests belonging to symmetry properties. An own approach has been made for symmetry calculation, resulting in many types of different representations. Out of this, only one has been chosen to determine symmetry feature points (SFPs), which are necessary for tracking and can also robustly be used to classify objects in the environment. Experiments show, that it is possible and also robust to track and classify those points.
Other experiments in using different symmetry features, like density models for mean symmetry, or combining them with SFPs might offer additional possibilities of feature extraction.

On this score, symmetry has the advantage that it is a more global feature than edge detection, for example. Edges can be robustly tracked too, maybe better than symmetry points, but it will be much more complex to assign an image's edge structure to some types of objects. By symmetry feature points, each object is reduced to one point, which makes it easy to classify it by its properties (e.g. position, colour and symmetry values). Thus, it can not only be used for range estimation, but also for situation recognition and probably for localisation and egomotion.
Further work in this area would consist in finding techniques to also apply localisation and egomotion.
The main disadvantage, which is very expensive calculation time, could be handled by hardware implementation. Reduction of image resolution is not advisable, because it surely affects the performance of feature extraction and all applications based on robust features.

Experiments for the comparison of symmetry with other feature extraction techniques have not been made. Thus, it can not be said, if symmetry is more robust belonging to illumination changes, occlusions or active motion.

In addition to this main subject, method for localisation by ORFs (Output Relevant Features) has been discussed. The experiments show that under certain circumstances, it is possible to estimate position by making a linear approximation between trained positions. Those were the basic approaches, problems and further work belonging to ORF localisation have been discussed.

For all experiments, it was cared about constant environmental conditions, e.g. constant light influence, no active motion or passive motion. The office environment can be characterized as experimental, because it is very simple belonging to number and type of appearing objects. These surely are strong restrictions regarding the ultimative goal of navigation in arbitrary environments.

In all applications discussed in this work, it is not proved that they work when there are different and dynamic locations. It can rather be said that they probably will not work, if not trained and adapted for the specific application and environment.

Thus, it can be concluded that all the described techniques can be used for robot applications up to a certain performance. The further development and improvement of this performance will be the future goal belonging to the subject of this thesis.