

Public executive summary

The prototype of a Viper camera with combined satellite/beamer provides an approach to combine technologies with orthogonal features to achieve a reliable depth map with high density. For a first setup the prototype uses four identical dedicated cameras for structured light in addition to a central Viper camera and two satellite cameras which provide a trifocal setup. All cameras are synchronized. Currently the structured light cameras and the trifocal setup are recorded on different devices.

In a dedicated shooting a static scene with different amount of occlusions, texture and depth was created. The recordings for structured light and for the trifocal setup were made sequentially since currently the requirements for lighting are still different. For structured light a *real-time* approach using only a single pattern as well as a *full* approach with several sequentially applied patterns was used.

Both approaches were first used independently to process depth maps. All depth maps were enhanced with a reliability map. In a next step several methods were investigated to combine both results, using the trifocal results as a basis and using structured light for the uncertain areas. In particular due to the provision of confidence maps the combined results are significantly better than the results from a single approach.

The new prototype will be used as a basis for further future enhancements.