Descriptions of the Odetics LRF and the range images

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Fourteen polyhedral shapes (illustrated in Figure 1) were constructed from plywood and covered with white paper. The objects are of "actual size". For instance, object (c) could be used as a chair by an adult. Sixteen images of each of objects (a)-(g) were taken spaced roughly evenly around each object. Similarly, seventeen images of each of objects (i)-(n) were taken. Two images of object (h) were taken. Each object's set of images is in its own ?.tar.Z file.

The images were acquired by an Odetics LRF. Images are 128×128 and encompass a $60° \times 60°$ field of view. The ambiguity interval is 9.37 meters and the range values are 8 bit, giving a depth resolution of approximately 3.66 centimeters. The laser beam covers a spot size of about 10

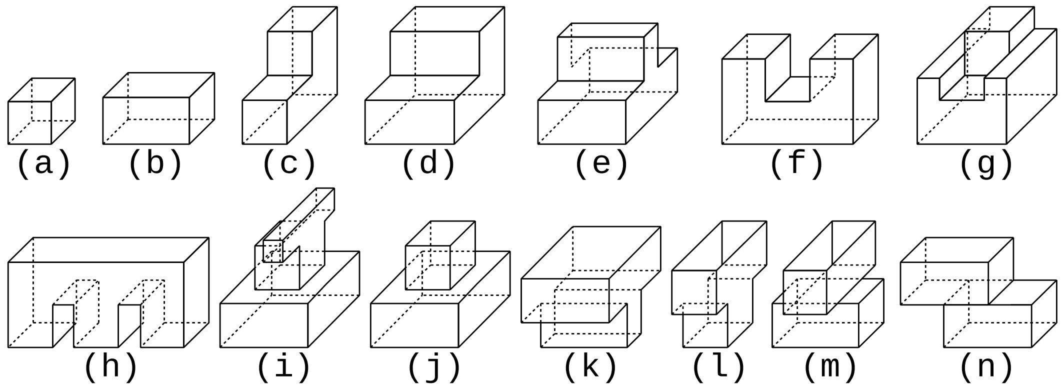

Figure 1: Models of fourteen objects imaged. Object (a) is a one-foot cube. The other objects are proportional. All dimensions are either 0.5, 1.0, 2.0 or 3.0 feet.

centimeters near maximum range. The raw images contain both range and reflectance values, row-ordered, alternating between range and reflectance values. The file OdeticsLRF.c in this directory contains routines to read in the raw Odetics image, split it into range and reflectance images, and convert the range values to cartesian coordinates.

The 112 images of objects (a)-(g) were all acquired while the Odetics LRF was mounted on the HERMIES-III robot. To remove the background noise from the polyhedral scene, the range image can simply be thresholded on a range value of 150. The 104 images of objects (h)-(n) were all acquired while the Odetics LRF was mounted on a table. To isolate the polyhedral object in the scene, the range image can be thresholded on a value of 100.

Acknowledgments

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