1. **What is ground truth?**

Ground truth uses a set of measurements that is known to be more accurate as compared to the measurements from the testing system. It is applied to various areas, such as satellite imagery, machine learning, remote sensing, etc. For example, we can use a known coordinates of a point on earth to specify a corresponding point in satellite image. In addition, ground truth is widely applied to image processing such as image segmentation, edge detection, etc.

2. **How to create ground truth?**

There are two ways to generate the ground truth. One is using known high accuracy instrument to get the measurement. For instance, ground truth is able to test the accuracy of 3D position estimation of a stereo vision system. The ‘ground truth’ positions can be obtained from a laser rangefinder which is known with much better accuracy. Then the ground truth positions are compared with the 3D positions estimation to evaluate the accuracy of stereo vision system. The other way is generated manually by human expert for the case that the results cannot be measured by device.

3. **Ground truth database for image processing.**

Since in lots of cases the effect of image processing algorithms cannot be evaluated by device or existing objective indicators, ground truth is often generated manually by human experts in the corresponding fields. However, the experts sometimes are not available for the algorithms testing. For instance, in medical image processing we need to segment the ROI (region of interest), but doctor is not around to confirm if the ROI is correct. Thus the ground truth image database is presented for the convenience.

There are lots of ground truth databases for image processing. Some databases are open to researchers. For example, there are 16 the databases in [2], including action databases (Hollywood 3D action recognition), medical databases (spine CT images), face databases (face recognition and tracer), fingerprints databases, gesture databases (hand gesture and marine silhouettes), eyes detection, object and shape detection, and so on.
Reference(s):