Pipeline steps

- Estimating surface normals using PCA of covariance matrix;
- Testing a local 3D descriptor, CoSPAIR (2016):
    - ISS3D keypoint detection;
    - Support radius divided into N concentric spheres;
    - Histograms of spatial concentric oriented surface points (surflet) pairs relation at each sphere;
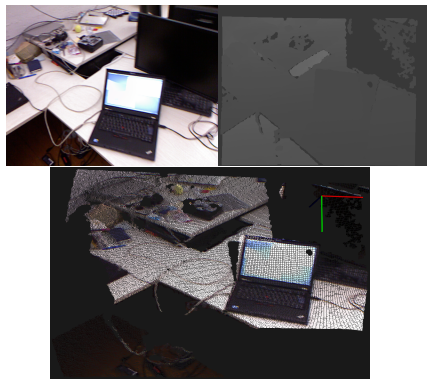   - Color histograms for each channel at each sphere;

Figure: RGB, depth and point cloud.

Pipeline steps

- Matching with L2-norm, querying using linear search or FLANN kdtree with k-nearest neighbors;
- Rejecting matched outliers with Lowe (1999) distance ratio check;
- Selecting best candidate with a naive voting scheme, aggregating votes using each inlier's match only.

Next steps

- Normal estimation (ex.: using integral images for organized point clouds (2013));
- Keypoint detection (ex.: alternative method or detection strategy);
- Local or global descriptors (or "turning" local into a global one by manipulating support sizes);
  - Shape and color preferred, making use of the RGB-D input;
- Querying strategy (ex.: alternative tree structures, inverted multi-index);
- Rejecting outliers (ex.: alternative checks, SAC variants);
- Voting scheme (ex.: probabilistic voting (2017)).