LabVIEW 3D Math Toolkit – Design

# Design considerations

* Should be able to install API and automatic add to LV pallets.
* Should have an Object-Oriented Design.
* Logic groups of functions.
* High level API with some Low level functions.
* Some functions should be locked.
* Follow NI API standards

# Functions

* 3D reconstruction
  + Image acquisition interfaces.
  + 3D depth maps
  + Point clouds
* 3D Registration
  + 360 degree representation of an object by aligning 3D point clouds from multiple 3D images
* Surface-based 3D matching
  + Arbitrarily shaped 3D objects.
  + Determines pose in 3D space.
  + Locate multiple objects in a single scene.
  + Can take occlusion into account.
* 3D object processing
  + Segment
  + Measurements
  + Extract various features
  + Filtering
  + 3D cross-section profile
* 3D surface inspection
  + Alignment of acquired 3D point cloud object with known model or cloud template.
  + Check and locate variations and deviations in the surfaces.
  + Deflectometry (inspection of specular and partially specular surfaces).