



3DTechnics

Scan to NURBS Note

taking scan data and turn it into data that can be used by a CAD program

Scanning gives data points in space - single points which together can be used to define a surface using triangles (STL). Each triangle is a separate face, with an inside and outside. This data is not scalable without interpolation.

IGES and 3DM files are based on NURBS - equations composed of polynomials and circles which together define a line or area in space. These equations are perfect, in that no matter how much you scale them they will give a data point at every location on the line.

Ideally, everything would be in NURBS. This is the format that you get from Solidworks, ProE, SolidEdge, Maya, or Rhino. It is compact and scalable.

Unfortunately there is no perfect way to take a scan data set of data points and convert them automatically to NURBS equations since the scan data is rough and it's not in regular lines.

Some ways that scan data to NURBS conversions are done:

- Programs like GeoMagic try to do the conversion by taking each triangle and creating an equation for that unit, and then creating an IGES or 3DM file. This gives huge data files which are difficult to work with to use unless it's for a small object or an object which has broad featureless faces.
- NURBS surfaces can be generated in SolidWorks by doing sections through the scan data and defining each line as a NURBS line. This is a time-consuming process, but yields acceptable results.
- The Rhino "Drape" function can be used to create a NURBS blanket over the scan data, and then use this. It yields a low-resolution version of the original scan data, but it works.
- Rhino-Reverse can be used to do the conversion.