



## IMPORTANT OF RECONSTRUCTION THE SURFACE SCANNED 3D

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**Abstract:** *There are some steps that have to be completed in order to be able to use the reverse engineering technique and one of them is the scanning of the pieces. This is made in order to get the necessary information regarding the dimensions and shape of the pieces. It also serves in obtaining the virtual model of the pieces or objects in a faster and easier way. At first we get them in the form of a cloud of dots or NURBS (non uniform rational B-splines) which, with the help of a software, are processed into B-splines curves or B-splines surfaces. This software uses an entire library of mathematical formula.*

**Keywords:** *scanner, RE, cloud of the point, CNC, manufacturing*

### 1. INTRODUCTION

Nowadays the technique of reverse engineering is increasingly used, known and applied in various fields. Let be from filmmaking, industry, medicine, entertainment. But application of this technology, it is different from one domain to another. From this reason appear many difference of definition for this term.

How understand some this technique?

This term is the process of analyzing of one system for to identify components of system and relationships between them for later to create one representation of system in another form or a greater degree of abstraction.

Automatically create of specification of a system with defining date available and codes aided.

Disassembly of a product hardware or software manufactured from another company for discovery of a operating mode of its, with intention for copy one or more functions of its, in another product.

During the process of RE, one cloud of points, obtained using scanning technique, it is used as basis for reconstruction of surface 3D CA, starting from physical model. This process ensure great increase of process for drawing and manufacturing.

This method operates in reverse direction classical engineering, which starting from

technical dates which he uses in process for manufacturing of object.

Reverse engineering it is the process for discovering the principle of operating of one device or of one system through structure analysis, function and operations their. Usually, reverse engineering involve disassembly or decomposition of system or of that device and analysis in detail of operation its, with scope for achievement of another new device or similar system which don't copy nothing from original [8].

Due to the widespread use of this technique appear many companies which have one point common. Such principle scheme of reverse engineering technique appear many form of its, but have line common. Some peoples say, it is enough make of virtual model of object and the technique of reverse engineering it is made, but others to lead this technique up to achievement prototyping with different manufacturing method.

### 2. SURFACE SCAN

The model used for this experiment is a sinusoidal surface. By the reconstruction of this surface, we attend to choose an optimal mesh for B-spline surfaces. Reconstruction has made software of scanner ATOS I 700. This scanner uses a white light source, which has the measuring volume 1000x800x800 and the

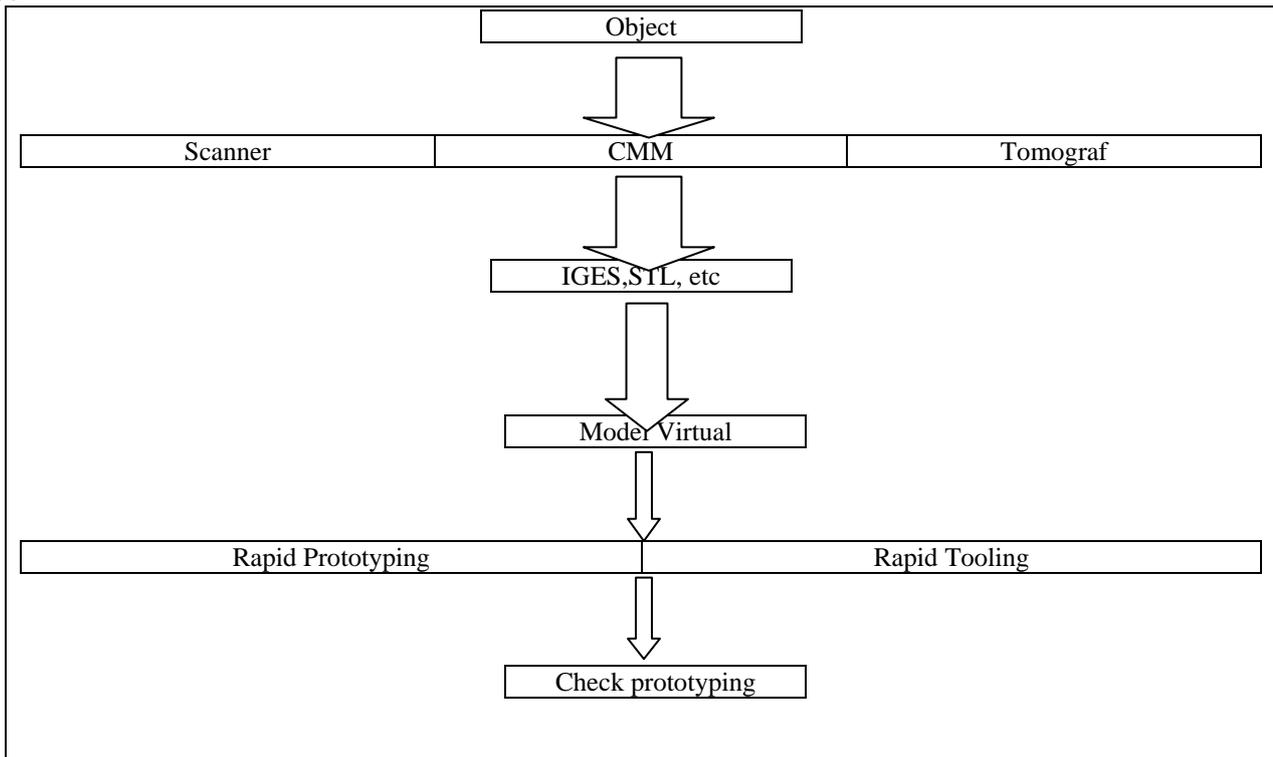


Fig.1. Principle scheme of reverse engineering

information it is read by two camcorders, them having an angle between them less of 20 degrees.

One cameras has resolution of 1032x776 pixels. The source of light it is positioned between the two cameras, more exactly at bisector angle formed by two cameras.

Preparing the workpiece for scanning.

Before starting scanning proper of model, piece must be prepared. The first step for prepared piece; model is analyzed in terms of color. In most cases this problem can be resolving after application of one layer thin of special spray. This should give the model the matte surface which don't allow reflection, but must be fine. If it is rough strong it is possible the source of light be absorbed, this make impossible reading information. At the same time the layer deposited not must be thick, no to change size the model and last but not least can be cleaned after scanning. Has been used the spray Helling Nord Test (Eindringruff system Entwickler).

After previously the model was covered with a paint layer ( white color) it should to apply the control points. This points of control are placed random but with some recommended.

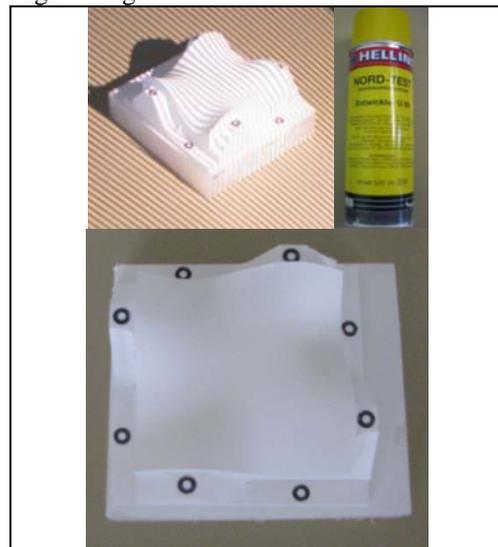


Fig.2. Preparing the part for scanning

In some cases the piece it can't be scanned from one position, needing n repositioning. By moving the piece from the initial position it loses the initial coordinated and so the completion o the surface scanned in the first time, with the second scanning it impossible. So was introduced the control points which practically keep in the soft memory the initial position of the piece. So it's possible the superposition of more scans after many repositioning. The primary condition is that from one scan to another (from one