

IR BASED 3D SCANNER WITH PRINTER

Abstract—IR based 3D (Three Dimensional) Scanner with printer is the low cost, product based research that focuses on three dimensional printing of scanned structure. Printing generally refers to making copies of text and images on any surface. When this printing procedure is slightly changed and made to develop a replica structure of any real world material then it is known as three dimensional printing (3D Printing). To develop a replica structure of any real world object it is necessary to have dimensional information of that object, therefore the machine we have developed extracts this information through scanning. Scanning is done in all three dimensions i.e. length, breadth and height of the object by using 3D Scanner. Scanner uses Infra-red sensor for measuring the dimension. The round trip time of IR signal helps to measure the distance which later gets converted into the dimensional quantity of the object. Three dimensional information obtained from scanner is plotted as point cloud which is reconstructed in the form of 3D image using MATLAB software. The constructed 3D image is exported from software in STL file format. STL file describes the surface geometry of three dimensional objects which is considered to be the input for 3D printer. Printing is based on additive manufacturing that means addition of material in layers to develop the replica of input STL file. The objective of the design is to construct a cost reduced three dimensional scanner with printer therefore, printed material may not be exact in all physical aspects but structure wise it recreates the scanned material.

Index Terms—3D scanner, 3D printer, real world object, Infra-red sensor, Round trip time, STL file.