**Abstract**

**Title:** DESIGN AND CONSTRUCTION OF A PHYSICAL AND COMPUTER ASSEMBLY THAT FACILITATES THE SCANNING OF 3D PARTS USING PHOTOGRAPHS TO PERFORM REVERSE ENGINEERING TASKS IN A CAD ENVIRONMENT\*

**Author:** Ramiro Javier Pérez Vergara\*\*

**Key Words:** Structure from motion, points cloud, three-dimensional reconstruction, Computer vision.

**Description:** 3D printing, video games, animation, computer-aided design, are current technologies with incredible flexibility, where the limits are set by creativity, even above one's own skill in handling the different software that is used. offer, as developers strive to provide increasingly graphical and intuitive environments; 3D printing, for example, which has become popular, allows users with very good tastes, but with questionable manual skills, to create vases with impressive designs, since a community has developed around this technology that shares their three-dimensional models online.

In this degree work, a 3D scanner was designed and built that facilitates the three-dimensional reconstruction of pieces using photogrammetric techniques, in this way to obtain true-to-life models without being an expert designer and with these data in a CAD environment the applications are again Limited exclusively by creativity, you can simply print a scale model of the scanned part using a 3D printer, export the data to video games, animations, even analyze the changes that have occurred in a certain part by comparing data obtained at different times, or reverse engineer. All this in order to provide more alternatives that bring the general population closer to this type of technologies that promote the development of society, for this reason a design with affordable cost characteristics and with the possibility of adapting a device of image capture according to the capabilities and requirements of the user, which can be from a mobile phone to a professional camera.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\*Degree Work

\*\*Faculty of Physical-Mechanical Engineering. School of Mechanical Engineering. Director. Ricardo Alfonso Jaimes Rolon. Mechanical Engineer