

Asesor: Dr. Manuel Servín Guirado

Sinodales: Dr. José Moisés Padilla Miranda
(Sinodal Interno, Secretario)

Dr. Manuel Humberto De La Torre Ibarra
(Sinodal Interno, Vocal)

Dr. Manuel Servín Guirado
(Asesor de Tesis, Presidente)

Tesis: "REVIEW IN DIGITIZATION OF SOLIDS THROUGH STRUCTURED LIGHT"

Resumen:

The use of the fringe projection profilometry is a wide field of study in optical metrology, and it has been in constant development due to the recent progress in image sensors and computers. It has application in many scientific and engineering areas; being one of the most common the measurement of object's shape.

This thesis discusses in a brief way the theoretical background in fringe analysis and the most commonly used methods to retrieve the optical phase of an interferogram. Also, here were reviewed and implemented structured light techniques to reconstruct the shape of solids and have a digital model of them. The reviewed techniques were co-phase fringe projection, on-axis fringe projection and 3D shape measurement by line projection. Meanwhile the co-phase and line projection were replicated from previous works done by Servin et al., the on-axis projection was done by using a novel configuration in this technique.

Moreover, as the final step in the fringe analysis is the phase unwrapping process, during this project was developed an algorithm, based in flood-fill scanning and quality-guided techniques, to make a continuous map of the object's estimated phase. This algorithm was tested on some phase maps in order to know its performance.