A 3D LASER SCANNING DEVICE FOR OBJECT RESTORATION USING POINT CLOUD REGISTRATION

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Certification

This thesis entitled **"The Design Development and Implemention of a 3D Scanner**" was carried out by **Ahmed Abba Sheik** with the matriculation number LCU/PG/001770 in the **Department of Computer Science, Faculty of** Basic Medical and Applied Sciences, Lead City University, Ibadan, Nigeria under my supervision and that this work has not been previously submitted.

Dr. Wilson Sakpere	**Date**
(Supervisor)	

Dr. Wilson Sakpere	**Date**
(Head of Department)	

Dedication

I dedicate this Thesis report to Almighty Allah whose love, mercy and guidance has sustained me through this Research report and for the knowledge and understanding provided to complete it. I also dedicate this thesis to my mother, Hadiza Abba Hassan for her support and caring throughout this thesis

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Abstract

3D scanning of environments and the objects have a lot of practical uses. During the last decade increased performance and reduced cost has made them more accessible to larger consumer groups. The price point is still however high, where popular scanners are in the price range of 300,000 NGN-500,000 NGN. The objective of this thesis is to investigate the current 3D scanners in the market, considering both time-of-flight and triangulation in terms of accuracy and limitations and compare there results to build a more cost effective model of the 3D scanner at the end of the thesis. For validation purposes the constructed 3d scanner will be put through tests to measure its accuracy and ability to create realistic representations of its environment.

The constructed model produced significantly less accurate results and scanning time was much longer compared to a popular competitor. This was mainly due to the cheaper camera sensor used for the model and not the mechanical construction itself. There are however many applications where higher accuracy is not essential and with some modifications, a low cost solution could have many potential use cases, especially since it only costs 1% of the compared product.

Keywords: Triangulation, 3D scanner, Time-of-flight, Laser scanner
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