

**Sudan University of Science & Technology**  
**College of Post Graduate Studies**

# **System Construction for Recording Holographic Fringes**

**A thesis Submitted as a partial  
fulfillment of the requirement for the  
degree of M.Sc. in physics**

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***Dedication***

**To**

***My Mother ....***

***My Sisters....***

***My Brothers....***

***My Friends ...***

***My***

***Father's soul....***

## **Abstract**

In this thesis the holographic system was constructed by using He-Ne laser (power 1mW), optical system and holographic film plates.

The system was designed in order to produce holographic interference fringes; this holographic fringe was captured by using a photographic camera.

The Avometer and photocell detector was conducted in series and the maximum laser intensity ( $I_{\max}$ ) and the minimum laser intensity ( $I_{\min}$ ) intensity value were registered in the center of the interfere situations (zone plate), Then the **MTF** was calculated to illustrate the ability of this system to produce interference fringes (i.e. the visibility of fringes).

## ملخص:

في هذا البحث تم بناء منظومة هولوغراف وذلك باستخدام هيليوم-نيون ليزر بقدرة واحد مللى واط واستخدام النظام البصري وشرائح الفيلم الزجاجية.

صممت هذه المنظومة بهدف إنتاج أهداب تداخل هولوغرافية وتم تصوير أهداب التداخل باستخدام كاميرا فوتوغرافية (Analog Camera). وصل جهاز (Avometer) مع جهاز (Photocell detector) على التوالي وتم تسجيل أعلى شدة لليزر المستخدم ( $I_{max}$ ) وأقل شدة ( $I_{min}$ ) وذلك في منتصف منطقة التداخل (Zone plates) ومن ثم تم حساب دالة التعديل (MTF) والتي توضح م قدرة النظام على إنتاج أهداب تداخل واضحة ويمكن تمييزها بسهولة.

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