

Abstract Submitted
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HOMER: the Holographic Optical Microscope for Education and Research¹ ANALI LUVIANO, Norwich University — Holography was invented in 1948 by Dennis Gabor and has undergone major advancements since the 2000s leading to the development of commercial digital holographic microscopes (DHM). This noninvasive form of microscopy produces a three-dimensional (3-D) digital model of a sample without altering or destroying the sample, thus allowing the same sample to be studied multiple times. HOMER-the Holographic Optical Microscope for Education and Research-produces a 3-D image from a two-dimensional (2-D) interference pattern captured by a camera that is then put through reconstruction software. This 2-D pattern is created when a reference wave interacts with the sample to produce a secondary wave that interferes with the unaltered part of the reference wave. I constructed HOMER to be an efficient, portable in-line DHM using inexpensive material and free reconstruction software. HOMER uses three different-colored LEDs as light sources. I am testing the performance of HOMER with the goal of producing tri-color images of samples. I'm using small basic biological samples to test the effectiveness of HOMER and plan to transition to complex cellular and biological specimens as I pursue my interest in biophysics.

¹Norwich University

Anali Luviano
Norwich University

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