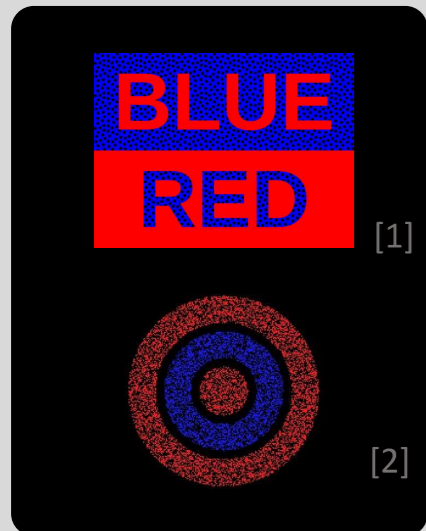


# Using Chromostereopsis to Enhance Depth Perception in Photos by changing the Hue



## 1. Background

Chromostereopsis is an effect where certain colors can appear to be at **different depths** on a 2d image. It is caused by the **refraction of light** on the cornea of the eye, which displaces colors at slightly different areas of the retina due to their **different wavelengths** [3], creating the illusion of depth. The effect can be increased using specially designed ChromaDepth glasses which use prisms to increase the refraction angle [4].

## 2. Related Work

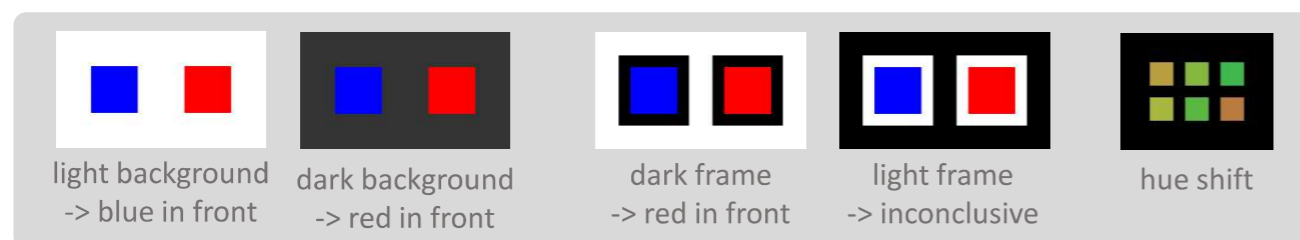
Existing algorithms with the purpose of enhancing depth using chromostereopsis can be split into 2 categories:

- For use **with ChromaDepth glasses**: hue is only used to portray depth [6, 7]
- For use on photos **without ChromaDepth glasses**: hue remains the same, only the lightness is changed to bring out depth through chromostereopsis [8, 9]

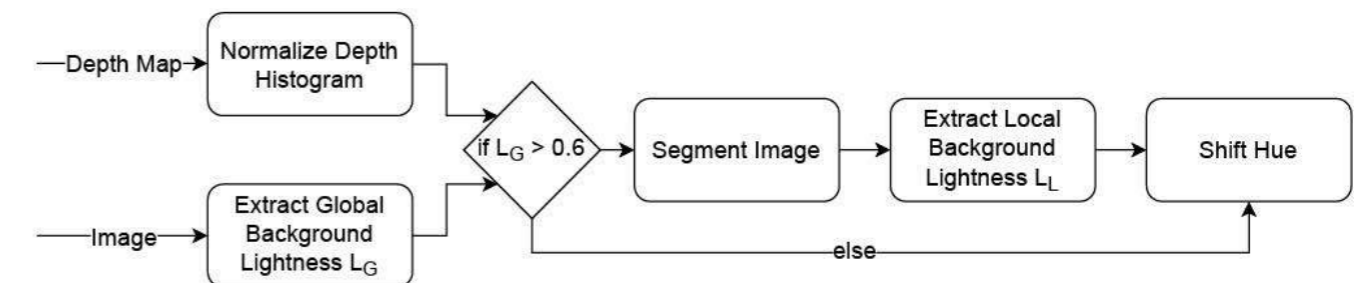
The idea of this research is to combine the two approaches to create an algorithm that changes the hue slightly according to the principles of Chromostereopsis. The resulting images have an enhanced perceived depth when viewed without ChromaDepth glasses.

## 3. User study

The user study investigated the influence of the global and local background on chromostereopsis as well as the best method to change the hue according to depth.



## 4. Depth Enhancement Algorithm



## 5. Results

The results can be seen on the following examples from a database with images and depth maps [10]. Examples (a) and (b) show the regular effect with a dark background, and example (c) shows the reversal effect.



Sources:

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