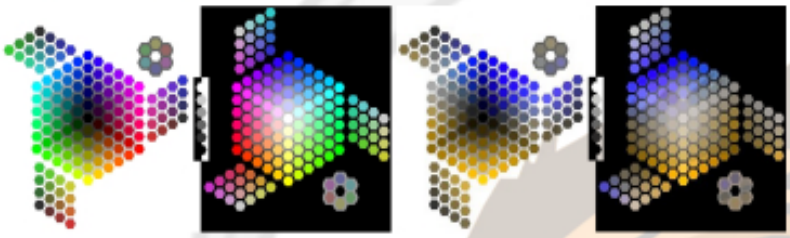
Computerised Simulation of Colour-blind and Colour Enhancement Assisted Colour-blind

Colour-blind Simulation

Many pictures, documents and web pages are hard for colour blind people to read because the people who designed them did not think about problem. The Colour-blind simulation technique lets them check their work for colour blind visibility. It is also interesting to anyone who is just plain curious about what the world will look like if you are colour blind.



Roughly 8% of people have some sort of colour vision deficiency. They often find it hard to tell red and green things apart. This means that they can not see things in a "normal colour" that normal people can see. Colour-blind Simulation is an algorithm of showing you what things look like to someone who is colour-blind.

There is currently no effective way to recover full 3-colour vision if you are red/green colour-blind. In some pictures, a lot of important information is conveyed by variations in reds and greens. This is a real problem for colour blinded who will miss this information. The important point to understand is that the 'true' colour of something may be irrelevant but the fact that it is different from its surroundings is very important. The Colour-enhancement technique can make information in pictures available to colour blind people.

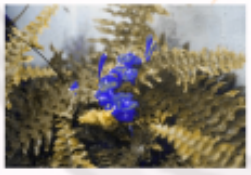
Colour Enhancement assisted Colour-blind

Colour!, why is it important? Apart from its appearance, seeing many different colours allows us to distinguish things in the world. Take the example below.

Normal people are able to see flowers easily.

People with red/green colour blindness have difficulty seeing the flowers. They see something that can be simulated like above image.

Image after applied the colour enhancement assisted colour-blind technique.



Colour-blind simulation of enhanced image. The people with colour blindness can distinguish the flowers because the colour of the flowers is different from the surrounding

Compare to other people's work

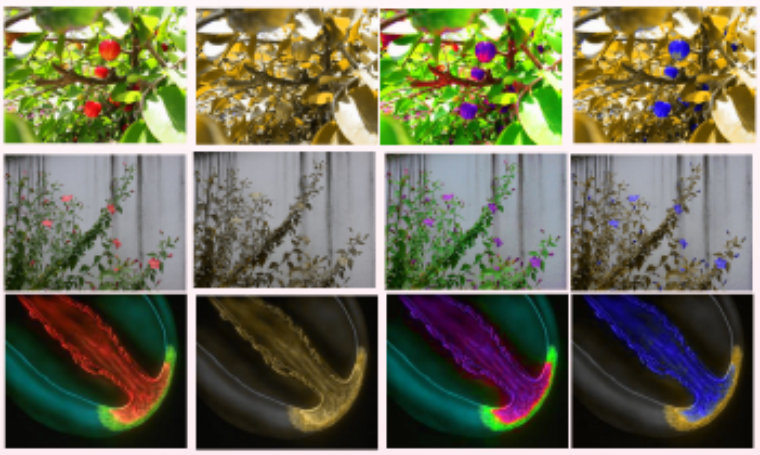
1. Original image 2. CB Simulation 3. CE image 4. CB Simulation on CE img.

Vischeck & Daltonize algorithms (Ref. URL: http://www.vischeck.com)

1. Original image 2. CB Simulation 3. CE image 4. CB Simulation on CE img.

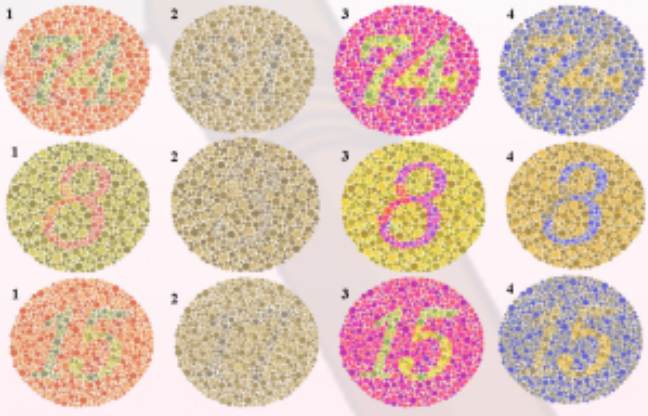
Colour-blind simulation and enhancement algorithms in this work.

More Results on other images



1. Original image 2. CB Simulation 3. CE image 4. CB Simulation on CE img.

Results on Ishihara test (The test for colour-blind)



1. Original image 2. CB Simulation 3. CE image 4. CB Simulation on CE image

Both computerised simulation of colour-blind and colour enhancement assisted colour-blind algorithms were incorporated into a software called E-LENS. E-LENS is an application which can zoom in on the computer monitor for colour-blind simulation and adjust the colour for better enhancement

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112 ถนนพหลโยธิน คลองหลวง จังหวัดปทุมธานี 12120
โทรศัพท์ 0-2564-6900 โทรสาร 0-2564-6901..3
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