Perception and Multimedia Computing

Colour Vision

Friday 20th Oct 2017

This lab sheet introduces some aspects of the perception and interpretation of colour.

1. This part of the lab involves constructing a Processing sketch to simulate Benham's disk

(a) Write a p5.js sketch to display the following image below. Make an effort to make your sketch code as simple as possible, with as few as possible repeated sections of code.

(b) Adapt your sketch from 1(a) to animate it, rotating the image about the centre of the circular design.

(c) Further adapt your sketch to allow keyboard input to increase or decrease rotation speed, and to change the direction of the rotation.

(d) Run your sketch and look at it. Describe what you see. What happens when the rotation gets faster? Slower? In the opposite direction?

2. This part of the lab involves writing a sketch to illustrate cognitive effects in perception.

(a) Write a p5.js sketch to display a grid of words, where the word in each space on the grid is randomly chosen to be one of "ONE", "TWO" and "THREE".

(b) Adapt your sketch so that each word is drawn in one of four colours: red, green, blue and black, again chosen randomly. Check that the choice of word is not correlated with the choice of colour (you may need to run your sketch several times).

(c) Run your sketch, and (quietly) read out loud in separate runs of your sketch
   i. each of the words displayed;
   ii. the colour of each of the displayed words.

(d) Alter your sketch to use the words "RED", "GREEN", "BLUE" and "BLACK" instead of "ONE", "TWO" and "THREE". How many literal '3's do you have to alter to '4's in your code?

(e) Redo 2(c) with your new sketch. What do you notice?

3. **This part of the lab involves implementing the mathematical transformations to convert between the HSB and RGB colour spaces.**

   (a) Write a p5.js sketch including a function which converts from an RGB representation of a colour to HSB. Compare your results with the result here: http://www.workwithcolor.com/color-converter-01.htm

   (b) Implement for your sketch the reverse conversion, from HSB to RGB.

Further Reading:

- Sacks, O., An Anthropologist on Mars, Knopf (1995)
- Zeki, S., A Vision of the Brain, Oxford University Press (1993)