COMS30020 - Computer Graphics

Week 2 Briefing

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Where are we ?

Hope that you all got RedNoise template working ?
If not, be sure to do so before next week !

Aim of this session is to introduce NEXT workbook
The practical is on Monday, so we need to be ready !

In this workbook we will actually do some drawing !
(but only very basic stuff - in 2D)

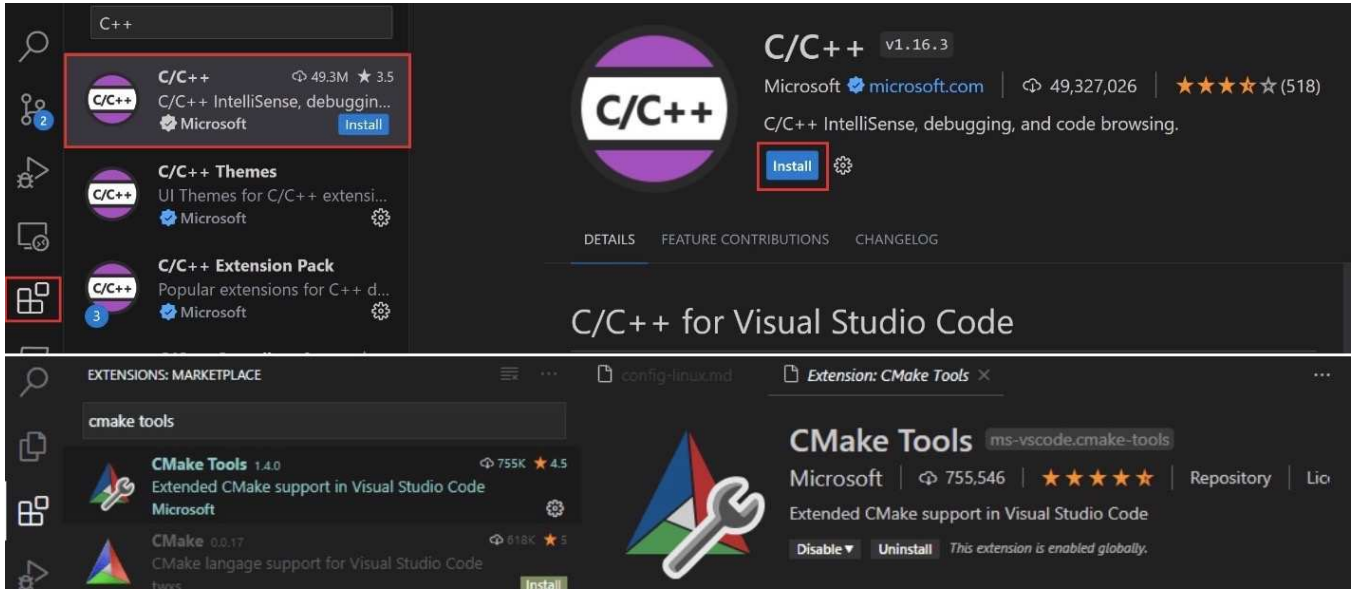
Later we'll be doing more sophisticated stuff in 3D
But we must learn to walk before we can run

Using IDEs

CLion seems to work well as an IDE for RedNoise (can open the CMakeLists.txt file as a project)

Some have been trying to get VSCode to work

You may need to install some extensions...

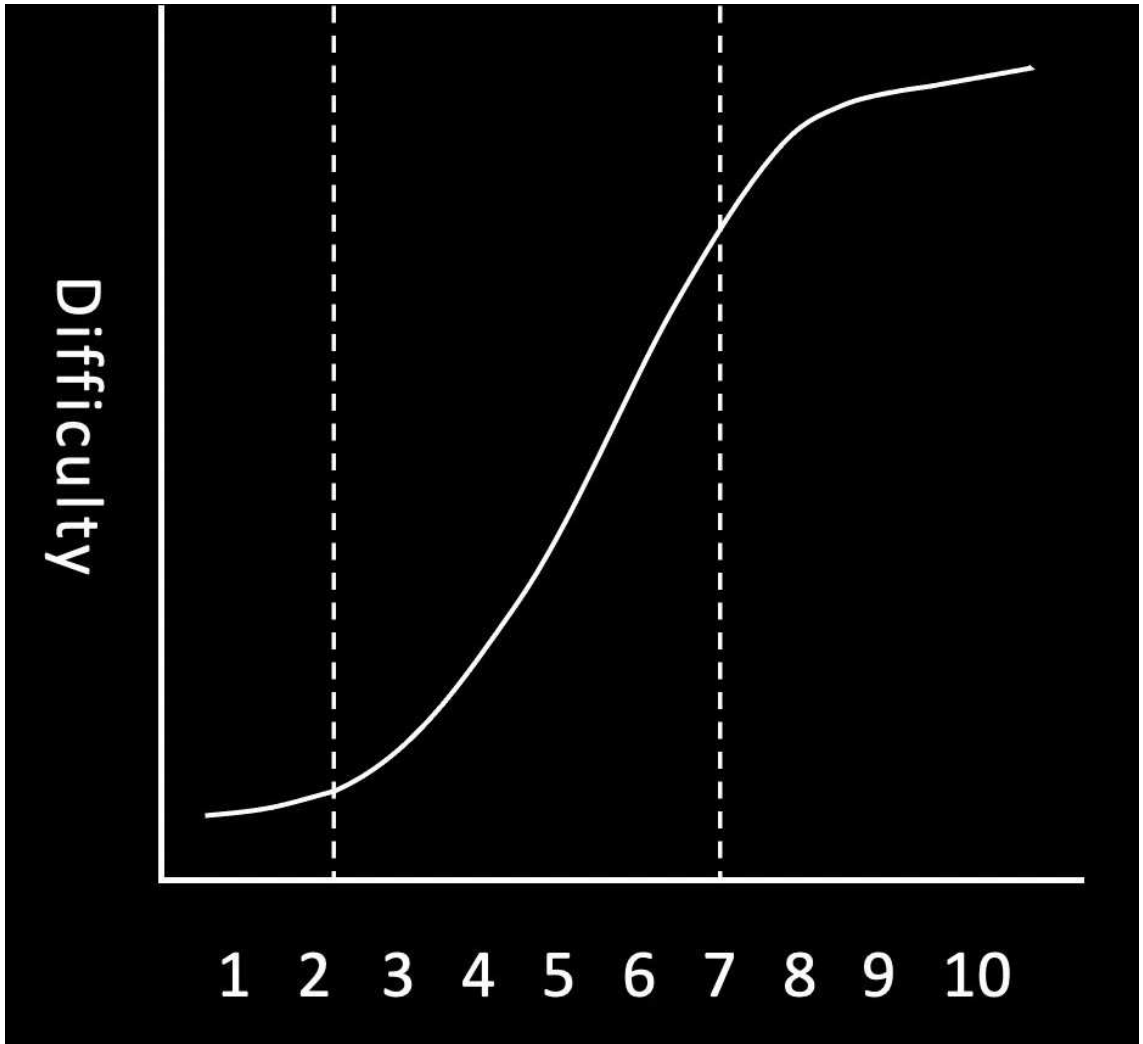


More details can be found here:

https://code.visualstudio.com/docs/cpp/cmake-linux

(some useful information for all platforms)

Where are we ?

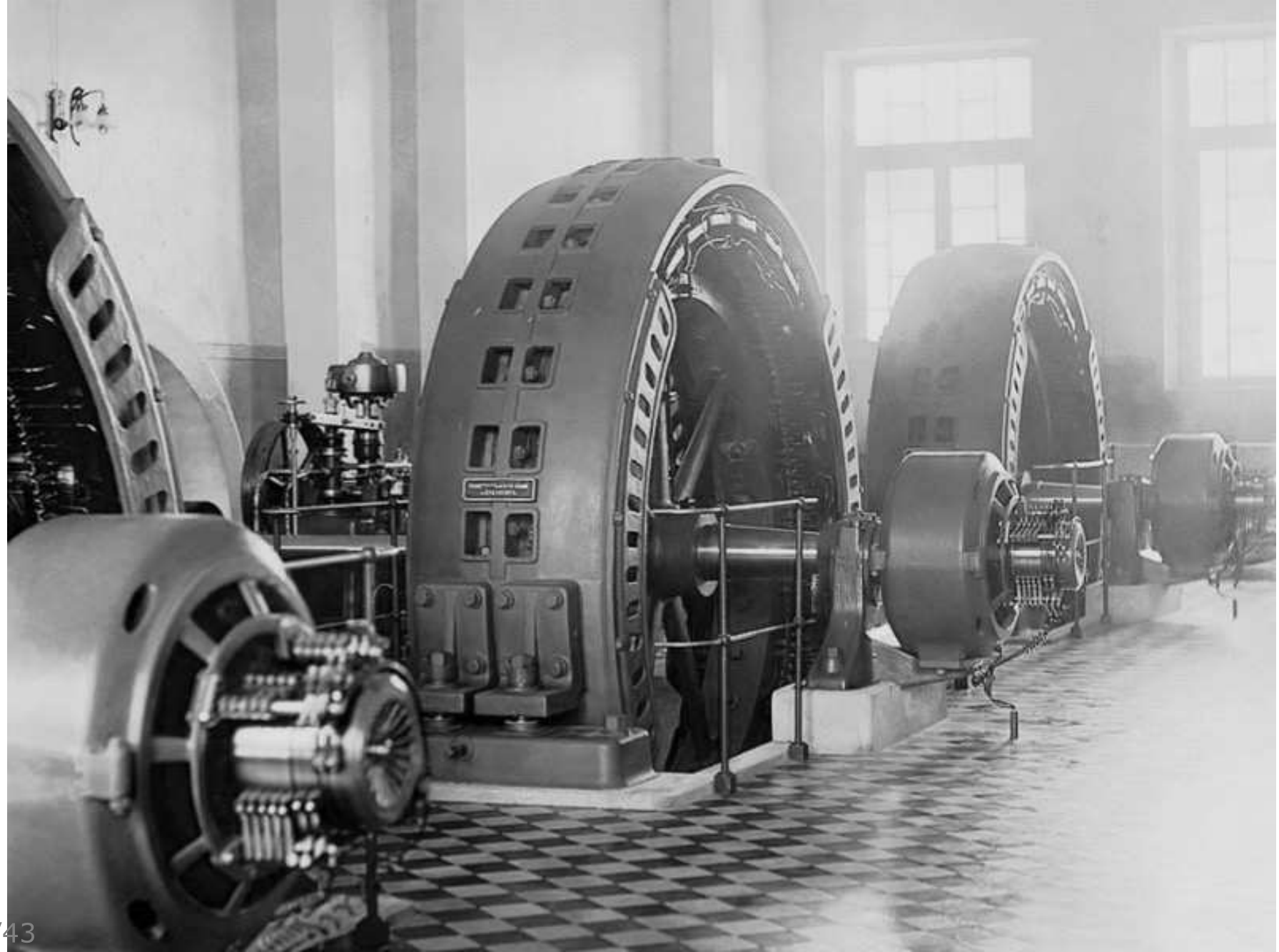


Before we look at the workbook

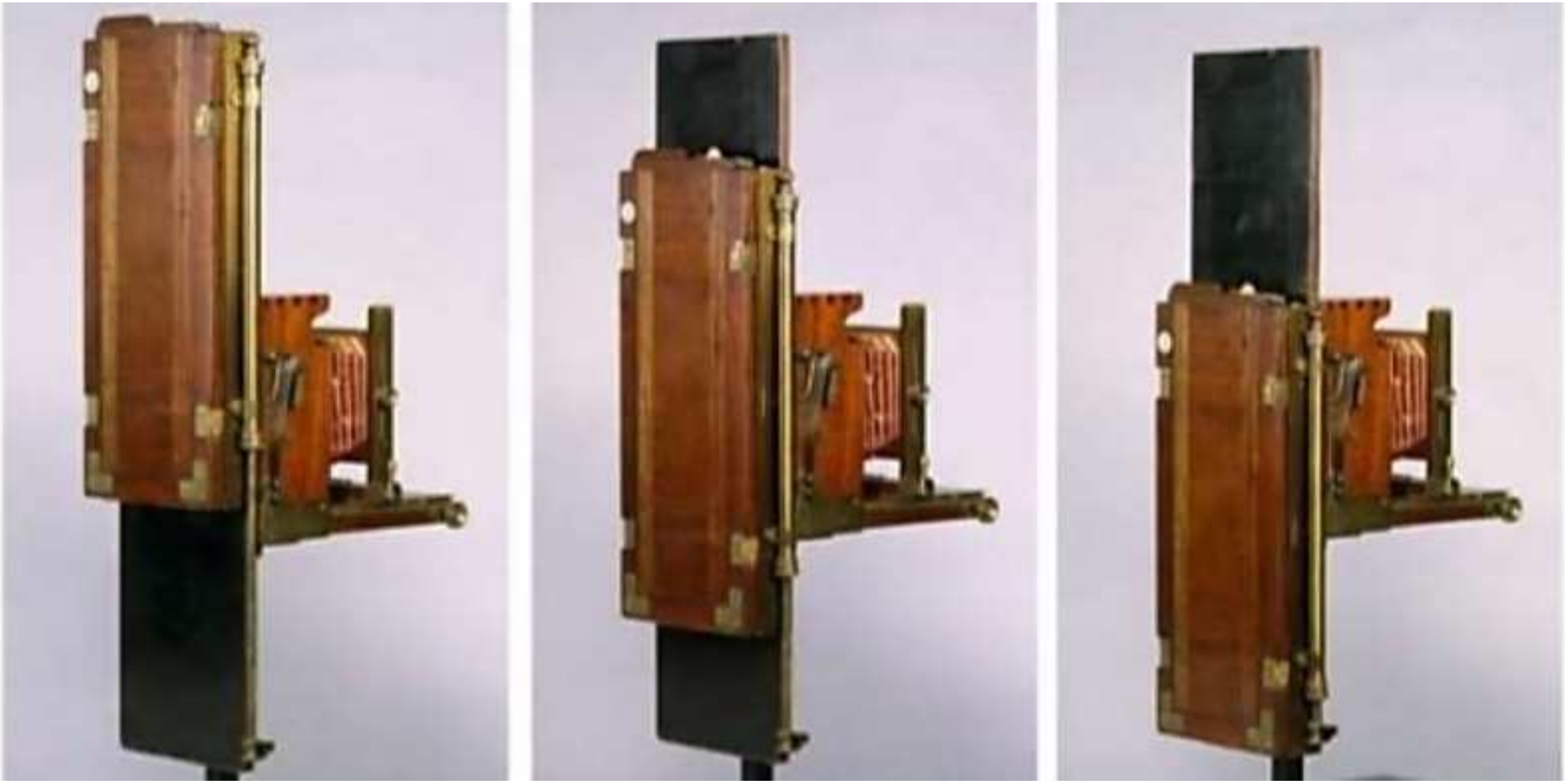
a slight digression...

Case Study !

Sergey Prokudin-Gorsky 1863-1944



Prokudin-Gorsky's Camera

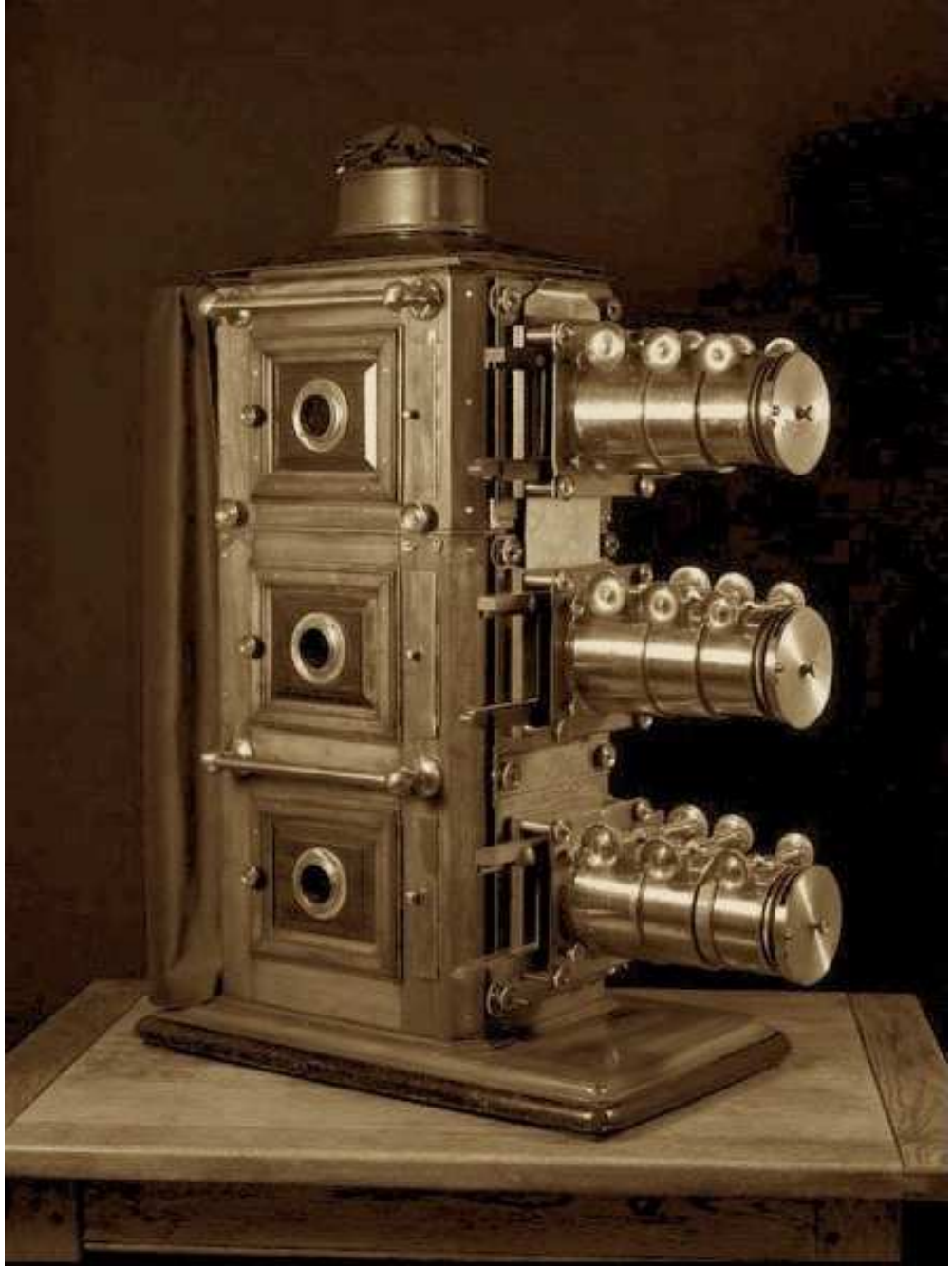


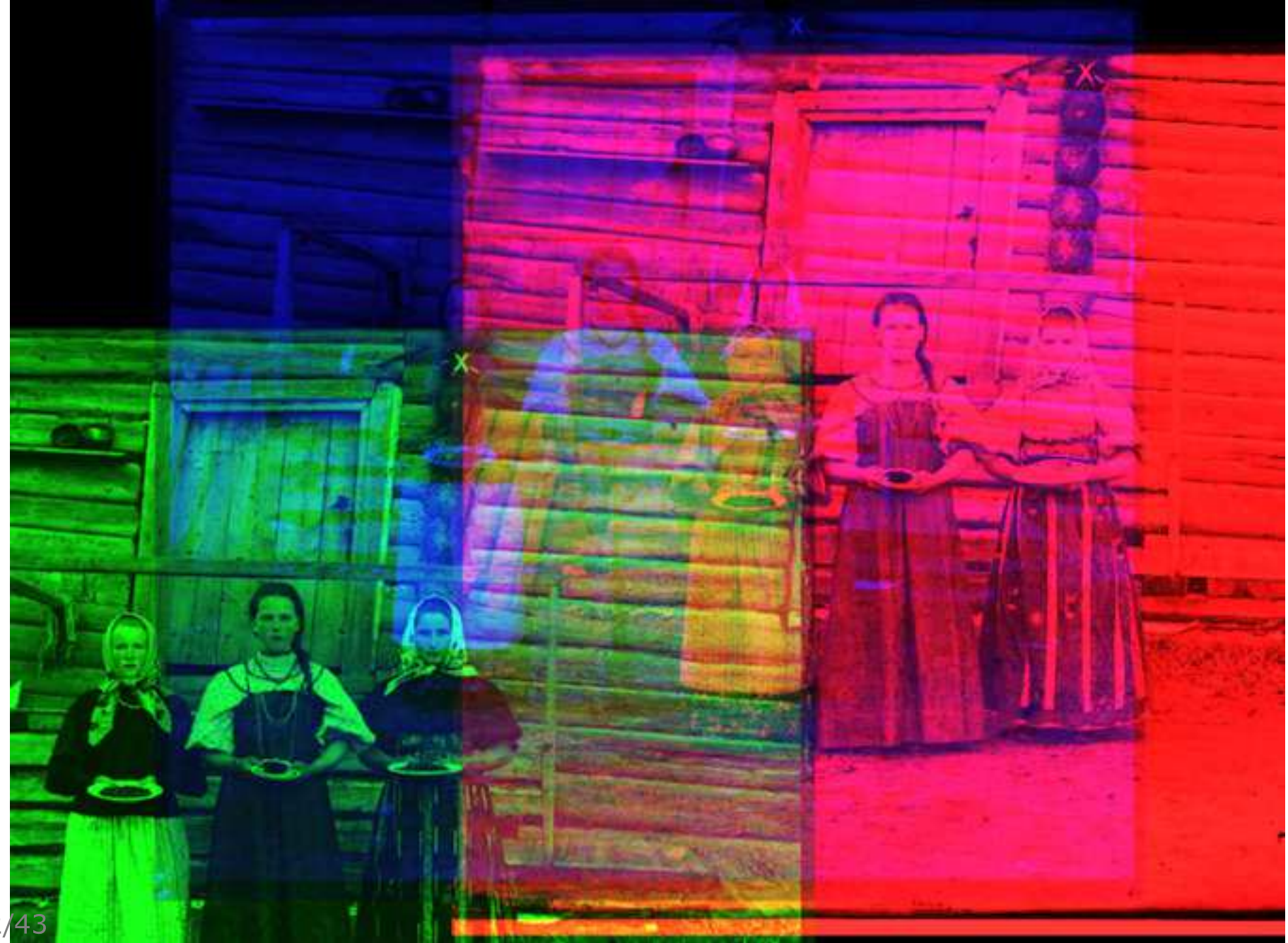
Red

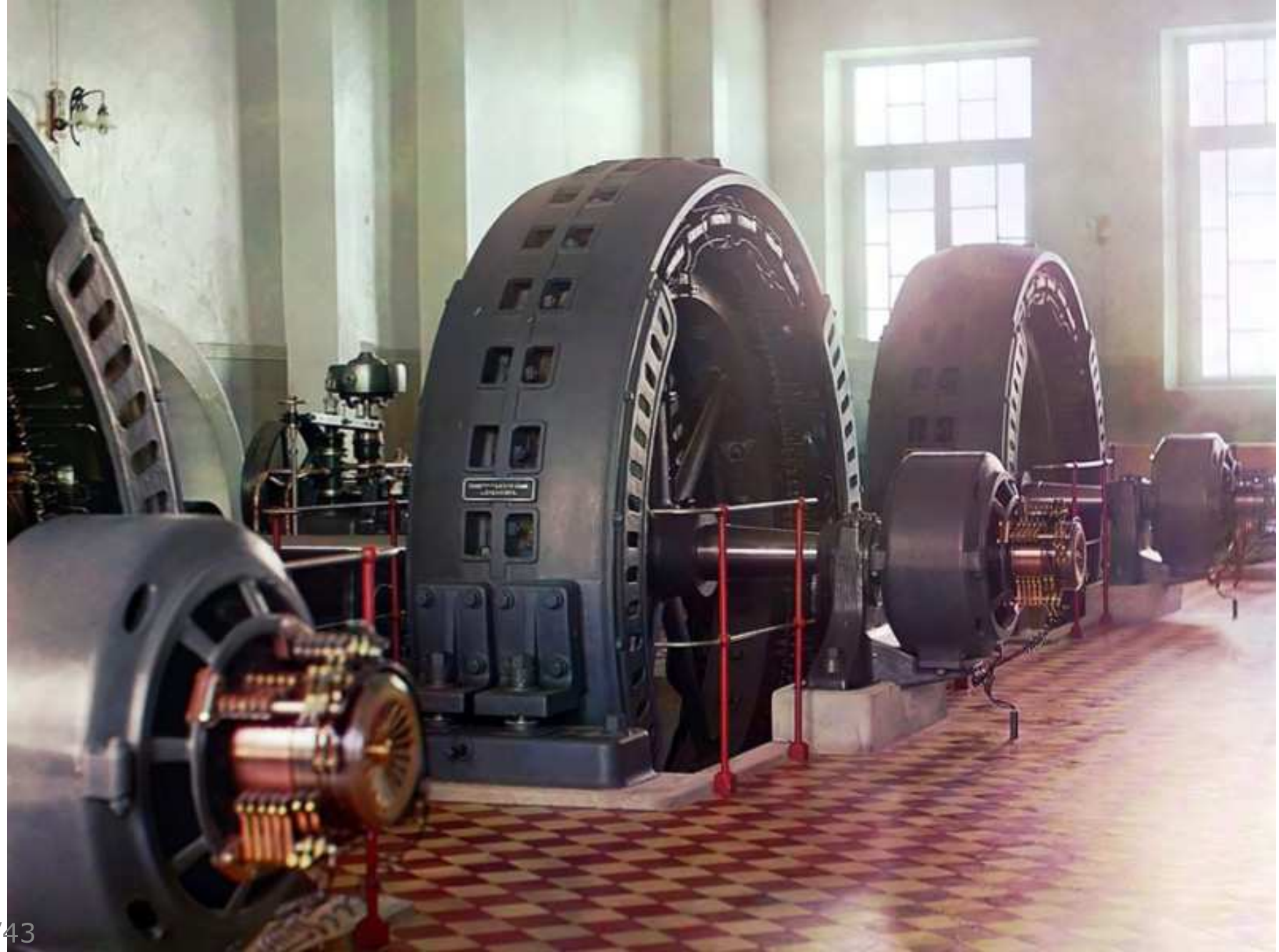
Green

Blue

But these are still all Black & White ?!?







Want to see more ?

Check out the US library of congress:

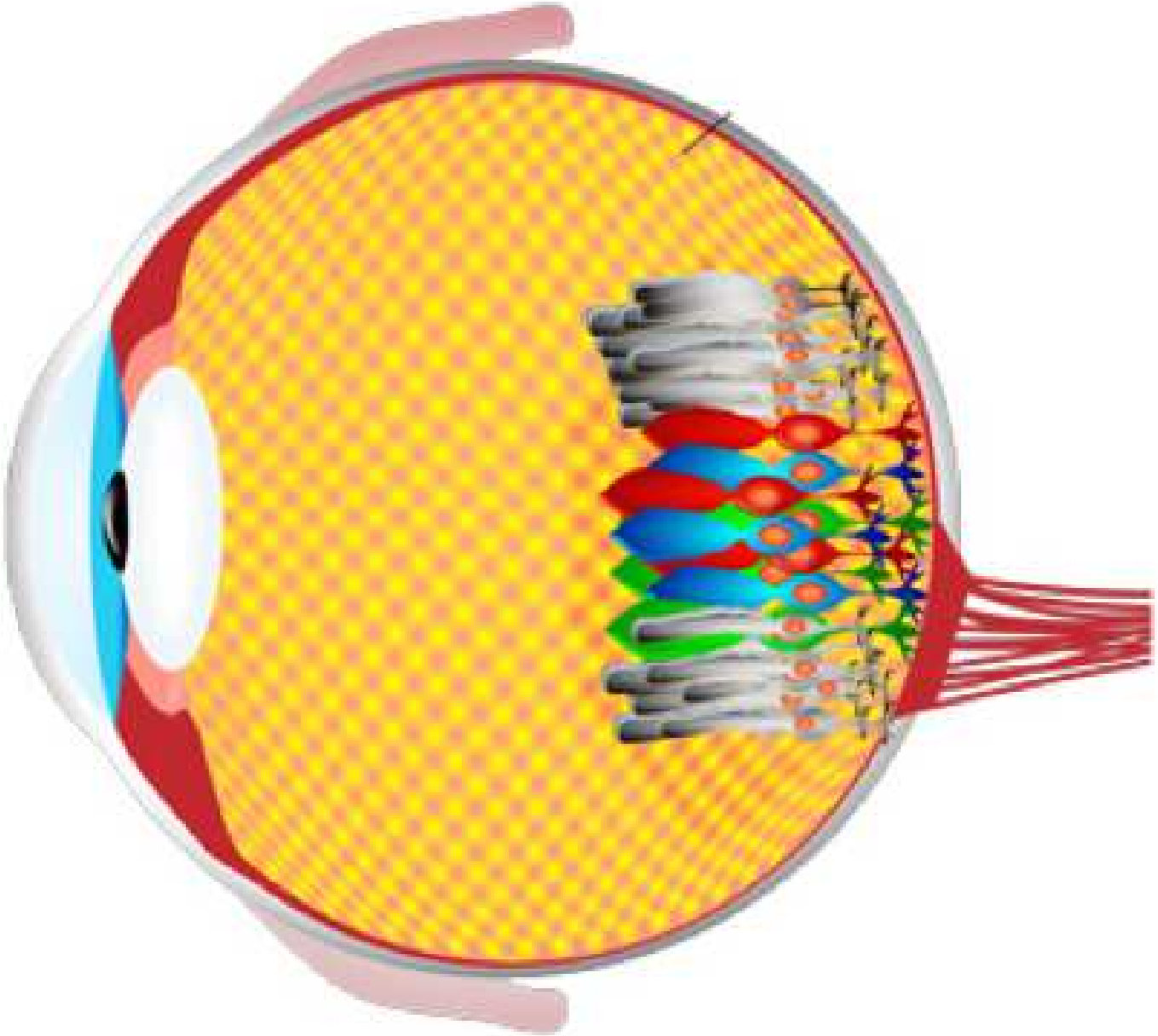
http://www.loc.gov/exhibits/empire/

Why am I telling you this ?

This concept of representing colour using three separate RGB channels still VERY relevant today

Basis of the majority of modern cameras, displays, projectors, file storage, image editing tools etc.

It's an *approximation* to real world colour
But it's good enough to convince the human eye...



Not everyone is the same !

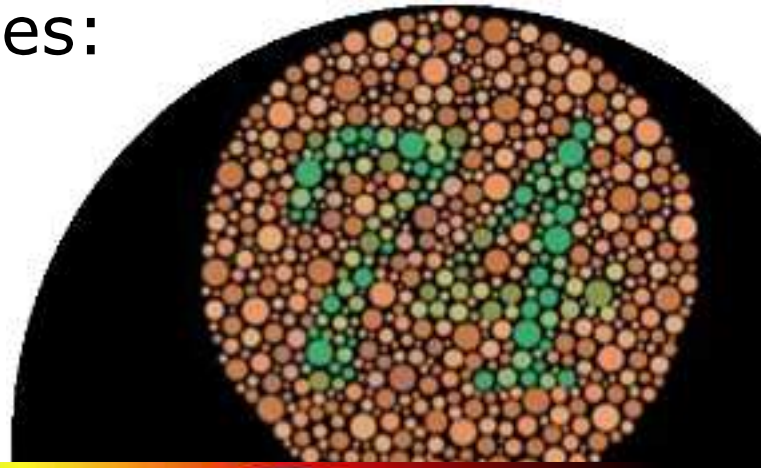
Be careful: notion of 3 receptors is a generalisation

Not everyone is identical

Some have less sensitive receptors or even...

Completely non-functioning cones:

- Red-green colour blindness
- Blue-yellow colour blindness
- Total colour blindness !



Tetrachromacy

A small number of people are "tetrachromats"

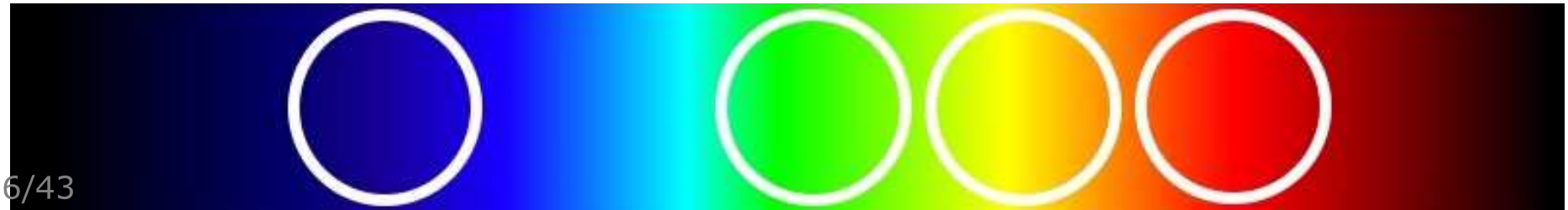
They have 4 types of colour sensing receptors !

Extra receptor has a pickup between green & red

This results in "increased chromatic discrimination"

(They can see a richer variety of colours !!!)

You might be one, but just don't know it :o)



Representing Colours

In SDL2 (and many other frameworks/platforms)

RGB colours are expressed as single 32 bit integers

3 channels (plus alpha) "packed" into one number

Each channel occupies 8 bits (0-255)

In C++ packing the int involves some bit-shifting

See slides in workbook for more details

Advanced Mathematics Test

1 , … , … , … , 5

What are the three missing numbers ?

Interpolation

Interpolation a key technique in Computer Graphics

We are going to apply it to a wide range of entities:

`Lines, Colours, Positions, Textures, Shading, Shadows`

We will start with simple floating point values

Then move on to 3-element numerical values

(so we can interpolate RGB colours, 3D positions etc)

Again, full details are in the workbooks

What's your Vector Victor ?

This week we'll encounter a slightly annoying issue
We will be using 2 different things called "vector":

- vector (from std) used as a dynamic list structure
- vec3 (from glm) used to store 3 element entities

Both inappropriate names, but what can you do !
Need to be careful - think about what you are doing
Use the right structure for the given situation

GitHub

Make sure you have created a private GitHub repo
Use this repo to manage all your work on this unit

You must invite GitHub user sl17668 to this repo
(so we can keep track of your progress on the unit)

Also, fill out the form at the end of workbook 1
(so we know who you really are !)

We'll make the workbook repo private next week
You won't be able to access it unless registered !

What to commit ?

No need to add/commit/push the workbooks
(I've already got those ;o)

Don't panic if you have already pushed everything
It's fine to leave it as it is for now (we can cope)

From now on, just push code you add to RedNoise
(and any images or data files that code uses)

This week's workbook

Let's take a look at this week's workbook !

Simon, if you please...

https://github.com/COMS30020/CG2023