



Controlling LIFX light bulbs from MATLAB

Here we provide some instructions on controlling LIFX light bulbs from MATLAB which you may wish to do for your outreach activity.

1. Prerequisites

MATLAB (tested on 2022b) with the Instrument Control Toolbox installed (software)

Provided MATLAB scripts: **lifx_udp.m**, **LightColours.m**, **NeonFruitIllusion.m**, **VaryingWhiteLight.m**

2. Practical implementation

The light bulb can be controlled through the following command:

```
>> packet = lifx_udp(h, s, b, k);
```

The input arguments: h specifies a hue value ranging from 1-360, s specifies a saturation value ranging from 0-1 (where 0 is white and 1 is a pure monochromatic light), b specifies a brightness value ranging from 0-1 (where 0 is off, and 1 is maximum brightness), and k specifies a temperature value from 2500 (cool) to 9000 (warm).

Some common usages can be found in the script **LightColours.m**, such as using the following command to produce a pure red light:

```
>> packet = lifx_udp(360, 1, 1, 9000);
```

3. The neon fruit illusion

Run the script **NeonFruitIllusion.m** to generate lighting conditions that can be used to produce the neon fruit illusion.

The light starts with a pure green light with a small amount of long wavelength light gradually slips in.

4. Gradual changes

Run the script **VaryingWhiteLight.m** to gradually vary a white light through the temperature parameter k , which is too subtle to easily notice its influence on objects that reflect the light.