



## 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.