# Code Assignment – Specim 2021

## Introduction

- You have an HSI camera that is giving you 16-bit 2D images of width and height.
- Let's assume that you are using an imaginary SDK which is giving you the images.
- Let's assume that you have already registered a callback function (see below) for retrieving images from the camera's SDK.

### Callback Syntax

```
void onDataCallback(unsigned short* dataPtr, int width, int height)
{
    // This function will be automatically called by an imaginary SDK (from its own thread).
}
```

- You can write this function to your example code and assume that it will get called automatically everytime a new image is incoming.
- The camera also has features that might change the image width and height on-the-fly. The new width and height will always be dividible by 2.
- If that happens; the updated width and height values will be given as parameters on the next time the callback function is called.

## Your Task:

- Write a producer-consumer implementation for writing and reading images to/from memory buffers.
- Write a separate simple example code of using your implementation. This example code also contains the imaginary SDK and its callback function 'onDataCallback'.

## Notes:

- The implementation and the example doesn't need to compile (so typos are ok), but other than that it should be valid C++ code.
- You can use libraries/frameworks if you want to. Just add the include and a comment on what library you are using.
- Consider that both the producer and the consumer might be used concurrently from different threads.
- The 'onDataCallback' function is called from another thread created by the SDK.
- The maximum width of the image is 640 and the maximum height of the image is 512. These values will not be surpassed.