Assignment Sheet 2

Asynchronous Transfers
Cross Correlation

Todo

- **Download exercise02.tgz from course web page.**

```
tar -xzf exercise02.tar.gz
```

Asynchronous Transfers

- **You might have noticed that the upload in the testDotProduct.cu was slowing down the overall performance, here comes the solution:**

- **Transfer data to the GPU in three different modes**
  - Using simple memcpy
  - Using memcpy from non-pageable memory
  - Using asynchronous memcpy with two streams

- **Use the provided skeleton and fill in the missing gaps**

Cross Correlation

- **Compute the normalized cross correlation between two images f,g:R^2→R, component-wise for RGB**

$$\bar{f} := \sum_{x,y} f(x, y), \quad \bar{g} := \sum_{x,y} g(x, y),$$

$$f'(x, y) := f(x, y) - \bar{f}, \quad g'(x) := g(x, y) - \bar{g}$$

$$(f' * g')(X, Y) = \sum_{x,y} f'(x, y) \cdot g'(X + x, Y + y)$$

- **Use the provided skeleton and fill in the missing gaps**

- **In folder images/ you will find example input images**
- **In folder referenceImages/ we have pre-computed the solution for different combinations of input images**
- **Use these pre-computed solutions to check that your code works correctly!**