# Assignment 1

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## 1 Main text

### 1.1 The processing time for one video frame or image.

The frame rate with no detection is approximately 62 frames per second. Which means that to process one frame takes approximately 0.0161 seconds or 16.12 milliseconds

### 1.2 How does the processing time change when you add the bright spot detection?

It depends of opencv is used for detection or two for loops. With opencv there is no drop in frame rate as it stays at 62 FPS or 16.12 milliseconds for each frame. The two loop is a different story, the frame rate drop down to 8 FPS which means that each frame takes 125 milliseconds to be processed.

### 1.3 Is the processing time identical when you do not display the image?

No difference was measured between displaying the image and not displaying the image , it still was 16 milliseconds for opencv detection and 125 milliseconds for two loops.

### 1.4 How does your for-loop implementation compare to the built-in function?

Detection seems to work exactly the same with for-loops and built-in function. The biggest differance is in the processing time as the loops take 8 times longer to process each frame.

### 1.5 Moving your hand in front of the camera, estimate the latency between image capture and display.

The latency is quite difficult to estimate for built in function and no detection at all. As with 60 FPS the latency is probably around 16 milliseconds. For the two loops approach the story is different, there is a noticeable delay between moving the hand and the hand being displayed, this makes a lot of sense as the frame rate is very small. The latency is probably the same as the processing time or 125 milliseconds.

### 1.6 Is the latency different when capturing from a mobile phone?

For built in function the latency is very small almost not noticeable. As soon as the two loops function is engaged the frame rate drops down to 4 FPS and the latency is very bad, if the hand is moved too fast in front of the camera the hand is not visible. The latency is definitely worse for mobile phone vs local laptop camera