

## Laboratory 4: Computer GPU Benchmark

### **Computer Graphics**

Our PCs use memory mapped graphics where the graphic image is stores in Video Memory and the image is presented to the screen by hardware. Originally the CPU wrote the screen image out to the video memory which was a dedicated part of the general purpose RAM. Modern PCs have a Graphics Processing Unit (GPU) that provides a graphics API for the CPU to use to describe the desired image and the GPU renders the image to video memory. A variation in high end GPUs is that they have their own private, high speed, video RAM which not only allows better graphic performance, but releases the general purpose RAM that would have been used as video RAM for other purposes.



### **Benchmarking a PC**

#### **Establish the baseline**

You need to first establish how well your PC performs with a low end GPU that came on the PC motherboard. This requires you to check the installed GPU and remove the fancy one, if installed, and then run a set of graphic benchmarks with a lesser capability GPU.

Now download and run the graphics benchmark discussed in Lab2:

<http://homepage.virgin.net/roy.longbottom/index.htm#anchorBMPSpd>

Note: Start at a reasonable largest size graphic and increase it until your system gets noticeably slow. Too large a graphic can crash the test.

MatLab: bench.m which includes very good 2D and 3D graphics benchmarks

Other useful free benchmarking packages are:

<http://novabench.com/download.php>

<http://www.futuremark.com/download/3dmark05/>

#### **Improve graphics performance**

Now install a high end GPU and run the same set of graphic benchmarks with hopefully better performance.

### **Benchmark Report**

We have examined the performance of a desktop computer in class as a function of installed GPU performance. Your report is discuss your benchmark results and the efficacy of adding a high end GPU to your personal computer and how much video memory you need to be satisfied with your PC's performance.