Paul Mickey

ENGL 2053

September 26th, 2018

Graphics Processing Unit

A graphics processing unit (GPU) is a computer chip that renders images (or graphics) onto a user's display. This component is different from a central processing unit (CPU) whose job is to carry out instructions from all programs and is more versatile.

The GPU starts out with the program --which could be a game, video-editing software, photo-manipulation software, or any other graphics-intensive program-- needing a calculation done, in order to output an image on the display. In most cases, it will use a vector (a quantity, defined by both magnitude and direction) or a matrix (a set of numbers laid out in tabular form). Then the GPU will process the calculation by running huge sets of data in parallel (if it is the same equation) and will display an output.

The most impressive feature of the GPU's calculations is that these chips can perform for other, non-video applications. A field that has benefited from GPUs would be scientific research because the researchers can run their data sets and get a result faster than a human can. Cryptocurrency miners, hackers, and businesses can use GPUs to process data at lightning fast speed. For example, a business can have the GPU process data in large quantities for financial analysis and/or prediction, making more accurate calculations much faster than a human.

This approach to computing data is different from a CPU because it is optimized to do one instruction at a time. Usually, those programs' instructions depend on the result that occurs in a previous step. A simple example is a web browser responding to a user's interactions; those steps are; a user clicks on a link, and then the web browser responds by loading the

corresponding page in the order the web page has been written in reading it from top to bottom, like a paper. Conversely, a game may have the GPU process (draw) the same line at different angles at the same time, to make a picture. A simple example would be an equilateral triangle.

In conclusion, the graphics processing unit is a computer chip that is now being used for more than drawing an image on a screen. People may say a GPU is now equally (if not more) important than a CPU in a computer system. The future is bright and promising for the GPU — especially with new technology like tensor cores (high speed cores inside a GPU that does machine learning making results faster) or ray-tracing (a new technology that draws light in a better way causing objects to look more “real”) — only time will tell.