Tyler Coppenbarger

Systems Concepts Games and Media

It seems the GPU functions that take the most time are the ones that copy data to the GPU. This likely takes so long because it must initialize the space on the GPU required to put the data there, It took around 90% of the time to copy the data of a simple dot program to the GPU, while it only took around 5% of the time to copy new data back from the GPU to the program.

Since the Floyd-Warshall algorithm is O(n3) running time, you would think using CUDA for the program would become more efficient early on. However, this is simply not the case. The program consistently ran much faster on one core than it did on many, based on the given code from the exercise. This makes me think that CUDA would not ever be efficient for this program, at least not before the connections on the graph reached the thousands.

The Floyd-Warshall algorithm can be used for pathfinding in games. If the possible path never changes, the algorithm could be used at the start of the game and the results would then be saved, making it easy to know the quickest path from any one point to another. This means more standard path finding algorithms, like Djikstra’s, don’t need to be run everytime an AI wants to move somewhere different; they would simply follow the path already created by the Floyd-Warshall algorithm. This means the game would likely sacrifice startup speed for running speed, however, but that may be a good thing for some games.