U14IT502

1st Review

Detection of cancer through deep learning and transfer learning of Deep Convolution Neural Network

Why choose GPU over a CPU for the deep learning process and the execution of the DNN?

CPUs are designed for more general computing workloads.  GPUs in contrast are less flexible, however GPUs are designed to compute in parallel the same instructions.   Deep Neural Networks (DNN) are structured in a very uniform manner such that at each layer of the network thousands of identical artificial neurons perform the same computation.  Therefore the structure of a DNN fits quite well with the kinds of computation that a GPU can efficiently perform.  
  
GPUs have additional advantages over CPUs, these include having more computational units and having a higher bandwidth to retrieve from memory. Furthermore, in applications requiring image processing (i.e. Convolution Neural Networks) GPU graphics specific capabilities can be exploited to further speed up calculations.

Hardware used:

* Nvidia Geforce GTX 1050ti with 768 CUDA cores
* Intel i7-7700HQ 4 multithreaded physical cores with 8 logical cores
* Optical camera

The tools used specifically for this project are:

(all used softwares are of 64bit compatibility confirmed)

* Matlab 2017 edition with support for CUDA enabled GPU
* Alexnet convolution deep neural network with modifications made
* Nvidia CUDA development 9.1
* Nvidia CUDA runtime 9.1
* Nvidia extension tools
* Python 3.5.2 anaconda version compatible with cuda and matlab