GPU Computing using PyOpenCL - Aditya Bhosale

About the speaker

I am a fourth year undergraduate studying Aerospace Engineering at IIT Bombay. I am primarily interested in HPC using python. For the past couple of years I have been contributing to PySPH. I am also involved in providing GPU support to PySPH using PyOpenCL. My bachelor's thesis titled "Nearest neighbor searching on GPU" involved an extensive use of PyOpenCL.

Abstract

The objective of the talk would be to give an intuition about the functioning of recurrent neural networks(RNNs), and a prominent RNN variation, LSTMs and their implementation using Tensorflow. Focus will be on their real world applications. Also,I'll on how to develop a character level LSTM language model for text generation using Google's deep learning framework 'Tensorflow'(python based tool) and my experience trying to develop one. The language model would be generic, in the sense that it can be applied on any text data to learn the grammar and mimic text generation accordingly. I'll be talking about the use of Tensorflow in general for deep learning applications as well.

Recurrent Neural Networks(RNNs) have recently generated a significant amount of buzz and excitement in the field of Deep Learning. They have been around for decades but their full potential has only recently started to get widely recognized, in large part due to our growing computational resources like Tensorflow. The agenda of the seminar will include:

- Difference between feedforward networks and recurrent neural networks
- What is a Recurrent Neural Network and issues related to them
- Long Short Term Memory Units or LSTMs
- Applications in various fields
- Use of Tensorflow in building learning models
- Character level LSTM using Tensorflow
- My experience with python and Tensorflow

RNNs have shown great promise in many NLP (Natural Language Processing) tasks; hence NLP-based applications will be provided more importance and explained in-depth. For our character level RNN model, we'll be coding in Python 3.6 and using Tensorflow, which is a deep learning framework that has been used in most of Google products such as Google search, spam detection, speech recognition, Google Allo, Google Now and Google Photos. Tensorflow is written in C++ and python, with the latter being more popular with software developers. Google has made Tensorflow open-source, similar to its other software like its android mobile operating system, enabling third parties and software professionals to work on the software.

I've also presented a seminar on a similar topic and have also written a related article. But it won't be the same presentation and I'll give more importance to the implementation part of it using Tensorflow. My main aim would be to tell everyone about my experience and motivate more people to use open source python based tools like Tensorflow.

As files are too large to upload, please find related documents here :
https://drive.google.com/open?id=0B3-iiAmR9uJiZEt3NVE2cXRRYVk