Onadipe's Journal

April 23, 2015

1 Week 1 - January 28, 2015

My activity for the week was centred on reading the paper titled *Algorithms for Numerical Analysis in High Dimensions* by Gregory Beylkin and Martins J. Mohlenkamp. I familiarized myself with computational complexity posed by functions of dimensions d which grows exponentially in d. I learned about approximating functions of high dimensions with a separated representation. I met with Samantha to discuss section 1 and 2 of the paper. I would be presenting section 1 during the meeting.

2 Week 2 - February 4, 2015

I looked at the paper *Algorithms for Numerical Analysis in High Dimensions* a little more. I also started learning the Python programming language. I installed the python shell and IDLE on my system. I am currently using the python shell for basic mathematical computations.

3 Week 3 - February 11, 2015

I read section 2 and 3 of the paper *Algorithms for Numerical Analysis in High Dimensions*, and will be presenting what I learnt . I will start my presentation on section 2.13, though will focus more on section 3 which discusses ways to reduce the separation rank.
I also continued my exploration of the python programming language.

4 Week 4 - February 18, 2015

I started researching on a way to add tool tips to pdf using latex. This is intended to make it convenient to reference details about a concept or formula once you hover the hyperlink on a pdf document. I also started writing functions in python. I wrote program to compute the derivative of a function, and to evaluate a function at a particular value. I also wrote a program to implement Newton's method.

5 Week 5 - February 25

I have been trying to implement fancytooltips. I found a documentation of fancytooltips and fancy preview on CTAN, but I ran into different issues trying to get the examples to run. I first tried on mac, but I couldn't run the examples or get Tex Live Utility to install

the required packages. So I tried on windows, and was able to install some packages on package manager. But didn't get examples to run because It keeps requesting installation of more packages.

6 Week 6 - March 12

I have been actively developing my skills in Data structures and algorithms in Python. Alongside, I researched about tooltips in pdf documents. I still can't find a way to run the examples for fancytooltips. There are other ones that does almost the same pdf commenting like fancytooltips such as cooltooltips. However, I ran into the same difficulty as with fancytooltips.

7 Week 8 - March 26

I researched about Tensors and their visualizations. I looked at the documentation for numpy being one of the packages used in the software code for visualization of tensors. I was able to get at a grasp of some of the cool features it provides. I was able to run the python code for trvtool, but have not explored visualizations . I ran into some issues installing gsview on mac or linux; I will explore this further. I continued my exploration of Python programming language and studied the implementation of some Abstract Data Structures.

8 Week 10 - April 15

I have been running the python code on some known cases from Dr. Mohlenkamp's research on Tensor Rank Visualization to get visualizations for 2 by 2 by 2 Tensors. I am yet to really explore open cases to find anything interesting and also to be able to conclude whether 3x2x2 tensors have two typical ranks.

9 Week 11 - April 23

I viewed the DSoTA project by Dr. Mohlenkamp on sagemath and run the pycode on T2G1cloud to see the error and stability of fitting a rank-2 tensor with a rank-1 tensor. I don't have any new information on my project.