

# Journal For Spring Quarter

Sruthi Devarachetty

## **Week1 - 04/01/2008 to 04/07/2008**

This quarter I will be continuing with the SinTrigonometricIdentity Project. In the first week of the quarter I worked on generating better images. I generated the target points in the form of a grid. Since the images are much better now I will have to start working on analyzing the images and working on why the images look a particular way by converting the point generated i.e.  $(x, y)$  into mathematical equations.

## **Week2 - 04/08/2008 to 04/15/2008**

This week I spent some time on understanding the previous work which would help me in the task of formulating the mathematical equations. I got a start on it but some assumptions (eg.rank) may be required to be made for simplicity so that after getting the result for the simple cases it can be extended to more complicated cases.

## **Week3 - 04/16/2008 to 04/22/2008**

This week I worked on deriving a formula to get a set of parameters i.e.  $a$ 's given a point  $(x, y)$ . A rank 5 point has the form  $\sin(a_1x_1 + a_2x_2 + a_3x_3 + a_4x_4 + a_5x_5)$  so the goal is to determine the set of  $a_i$ 's that would result in a point  $(x, y)$  on the plane. I started deriving the formula and reached the last step where I needed to plug in certain results but I realized that it would get complicated as I would have to compute the product of five terms involving trigonometric terms in it. So I replaced that with a general function but now I have to determine a way to reach the goal either using the result I derived or starting all over again with a new idea.

## **Week4 - 04/23/2008 to 04/29/2008**

This week I continued with the work from the last week in terms of determining some new way of solving the problem.

## **Week5 - 04/30/2008 to 05/6/2008**

The last week I was working on deriving the formula to get a set of parameters i.e.  $a$ 's given a point  $(x, y)$  but it is getting pretty complicated to derive it theoretically. So instead of that Dr.Martin suggested to do the random walk around a target point and print the set of parameters i.e.  $a$ 's that would give that point. So I have worked on this part and am able to print the set of  $a$ 's successfully. Now, the next task would be to do the random walk with descent around a target point which would give the darkest point i.e. the point with the minimum angle and print the coefficients of that point.

## **Week6 - 05/7/2008 to 05/13/2008**

This week I worked on the random walk with descent which gave the darkest point and also started working on the poster.

The next task is to do the random walk around each grid point. I started working on it but it is taking a lot of time to generate the image because it has to iterate through a large number of points to determine the points finally selected to be plotted. So I will try to generate the images again.

## **Week7 - 05/14/2008 to 05/20/2008**

This week I generated some more images of random walk around each grid point with and without gradient descent.

## **Week8 - 05/21/2008 to 04/27/2008**

This week I started working on the poster presentation. My topic was "Visualizing Sets of low-rank Tensors". The poster was created in LaTeX so the initial preparation was time consuming and required a lot of effort but at the same time it was very interesting as I learned a lot during this process.

## **Week9 - 05/28/2008 to 06/04/2008**

This week we were getting ready for the poster presentation scheduled on 30th May, 2008. The poster presentation went pretty well and everyone seemed to like it. Now I have to start working on my Journal and Final report.