

# Journal for Spring 2007

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## 1 Week 1, March 28 to April 3 :

### Work done in this week :

This week I read the paper titled “Approximating a Wavefunction as an Unconstrained Sum of Slater Determinants” and tried to understand the details of the paper. My teammate and I approached Dr. Martin to clarify the doubts in the paper. I could understand most of it but I still need to read it for thorough understanding.

Also I helped Krishna and Kristen in using  $\text{\LaTeX}$  and showed them the basic usage.

### Goals for the next week :

To once again read the research paper and completely understand it.

## 2 Week 2, April 4 to 10 :

### Work done in this week :

I once again read the same research paper and I am comfortable with the paper. This week we started with another paper titled “Center-of-Mass Principle for the Multiparticle Schrodinger Equation.” This paper uses the principles discussed in the first paper.

### Goals for the next week :

To completely read and understand the paper. This paper assumes the rank of the matrix used in calculating the antisymmetric inner product to be one. Our task is to calculate it using the matrix of higher rank.

## 3 Week 3, April 11 to 17 :

### Work done in this week :

This week we tried to calculate the antisymmetric inner product using rank-2 matrix instead of rank-1 and we succeeded in it.

### **Goals for the next week :**

To calculate the inner product for different positions of rank-2 matrices in the antisymmetric determinant.

## **4 Week 4, April 18 to 24 :**

### **Work done in this week :**

This week we completed calculating the inner product for different positions of the rank-2 matrix. And we tried to calculate it using rank-2 matrices in two positions simultaneously. We got a lot of messy stuff and we need to arrange it in an orderly fashion.

I also showed Krishna the Python IDE and helped him in running the python script.

### **Goals for the next week :**

To complete the calculation of inner product using two rank-2 matrices simultaneously.

## **5 Week 5, April 25 to May 1 :**

### **Work done in this week :**

This week we expanded and analyzed the determinant used in calculating the inner product and tried to understand the way in which the terms are appearing. We came to a decent conclusion about this and we are still trying to find a better way.

### **Goals for the next week :**

To come to a similar conclusion about the determinant when the ranks of the matrices are increased.

## **6 Week 6, May 2 to 8 :**

### **Work done in this week :**

We tried to expand the  $8 \times 8$  determinant. But we could not draw any useful conclusions from the expansion. Dr.Martin asked us to present the details of our work to the other group members.

### **Goals for the next week :**

To still work on the same determinant and prepare for the presentation.

## **7 Week 7, May 9 to 15 :**

### **Work done in this week :**

This week Dr. Martin tried another approach for expanding the determinant. And in this we made use of the two identities and we could get same results as with the previous approach. Jyothsna presented the details to the other group members.

### **Goals for the next week :**

To understand the new approach and further work on it and prepare for the presentation.

## **8 Week 8, May 16 to 22 :**

### **Work done in this week :**

I presented the details of the new approach to the other group members. I could not attend the meeting on Thursday as I was ill. On Monday we further discussed the details and came out with some new ideas.

### **Goals for the next week :**

To completely understand the new approach. To write up the conclusions of the new approach.

## **9 Week 9, May 23 to 29 :**

### **Work done in this week :**

This week we are supposed to present the work done this quarter to other members of the group. I prepared for the presentation and I am ready for the presentation.

## **10 Week 10, May 30 to June 5 :**

### **Work done in this week :**

Dr. Martin asked us to prepare a report about the research done this quarter. Initially I had problems executing the TEX files. I am still working on it.