

Journal for Winter 2008

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March 17, 2008

Week 1, Jan 16

After a long winter break our Determinants group met on Thursday. I was given a research paper titled 'Use of geometric algebra : compound matrices and the determinant of the sum of two matrices'. There was not much work this week, all I did was I brushed up my previously learned things. I went through the paper only once and I am still working on it.

Things to do for next week

To completely read and understand the paper, and present the details to other members of the group.

Week 2, Jan 23

The main task for this week was to finish reading of the paper and understand it. I read the paper several times and I could get the central theme of this paper, but there are some sections about which I have no clue.

The main scope of the paper is to find a formula for the determinant of sum two matrices using Grassman algebra and Compound Matrices.

Things to do for next week

To read the paper once again and try to understand the details on Compound matrices, adjugate matrices and the Binet-Cauchy formula

Week 3, Jan 30

Again this week, I worked intensively on the same paper. The formula derived in this paper is similar to the one which we have derived, except that it uses the compound matrices instead of the matrix unfolding. Each entry in the compound matrix is calculated by including the appropriate rows and finding the determinant of the minor. Then these are arranged in the lexicographical order.

Dr. Martin asked me to know how to calculate the compound matrices for 3×3 matrices. I googled, and found definitions. I am still working on how to compute these matrices. I now know how to calculate the size of these matrices. But I am still not sure how to compute the elements.

Things to do for next week

To completely understand the concept of Compound matrices and to know if the paper is useful to us in our research.

Week 4, Feb 6

There is not much progress this week. Again I made several unsuccessful attempts to understand the Compound Matrices and apply it to 3×3 Matrices. Though I got the definitions for Compound matrices and formulas for finding the entries, I am still unable to calculate them. This is because I did not understand the terms in the formula properly. So I need to work more on the formula.

Things to do for next week

Again the goal for this week is to understand the notion of compound matrices completely. I want to find the compound matrices for a 2×2 matrix, and to properly understand the terms in the formula and calculate the entries.

The paper cites a formula for determinant of sum of matrices based on Binet-Cauchy theorem. And they derive another formula. I should figure out the difference between these two and find which one is better and useful for our research. I hope to reach these goals by next week.

Week 6, Feb 20

At last I could understand the notion of Compound matrices and how to compute them. We compared the formula given in the paper with the one we derived. Both of them seem to have similar structure and involved almost the same logic.

Dr Martin asked to prepare a report on these topics. I have started writing the report.

Things to do for next week

The main goal is to complete the report on compound matrices, adjugate matrices and the formula for the determinant of the sum of matrices. The other goal would be to prepare for a talk on the contents of the paper and the notion of compound matrices.

Week 7, Feb 27

This week I started writing the report. I included the definition of the compound matrices, their properties and the applications. I also included the definition for adjugate matrices and the details of Binet-Cauchy formula. Dr. Martin gave me some corrections and I worked on those corrections.

Things to do for next week

To make the corrections suggested by Dr. Martin and complete the report.

Week 8, Feb 27

This week I made the corrections given by Dr.Martin and I am almost done with the report. Also I tried to use the Binet-Cauchy formula for the case of 2×2 matrices. Initially I had some problems and then I could successfully calculate the determinat of sum of two 2×2 matrices. Also next week I am supposed to give a presentation on the compound matrices and Binet-Cauchy formula.

Things to do for next week

To include the exmple into the report and prepare slides for presentation.

Week 9, March 12

I prepared some slides for my presentation and sent it to Dr. Martin for corrections. There were a couple of corrections and I corrected them. I am done with slides and ready for the presentation.

I finished writing the report, with necessary changes suggested by Dr.Martin and included an example in the report. I also finished my final journal and I am pretty much done for the quarter.