S3 Text. Method to deal with the limitation of computer nodes

This process provides a widespread way to use LSGPA on the other machine which may contain different computing nodes. *Max_N* is the maximum number of computing nodes.

```
Master process:
Data input
→  Calculate MI value of between all gene pairs and get the MI matrix
→  Clustering genes through MI matrix, M clusters.
→    MPI_Broadcast M to all Slaves
→    If M<=Max_N
do{
→  Extract every cluster data
     {
         MPI_Send data1 to Slave 1.
         MPI_Send data2 to Slave 2.
         …
         MPI_Send dataN to Slave M.
            }
→   MPI_Revc Net 1 to Slave 1.
    MPI_Revc Net 2 to Slave 2.
    …
    MPI_Revc Net M to Slave M.
}
→    If M>Max_N
do{
→  Extract every cluster data
      {
      MPI_Send data1 to Slave 1% Max_N
      MPI_Send data2 to Slave 2% Max_N
       …
      MPI_Send dataN to Slave N% Max_N
         }
→   MPI_Revc Net 1 to Slave 1% Max_N
    MPI_Revc Net 2 to Slave 2% Max_N
    …
    MPI_Revc Net N to Slave N% Max_N
   }
  Note: % said modular arithmetic, which is the largest Slave number was 169, when the block
number is greater than Max_N, such as cluster(Max_N+1) assigned Slave 1, (Max_N +1)% of
Max_N = Slave and cluster (Max_N+2) assigned Slave 2, ( Max_N+2)% of Max_N = Slave so
cycle.
→  Combine Net1~N and finally we obtain Net
→  Out put Net
Slave process No.1:
→  MPI_Revc N from Master process.
→  If N<= Max_N
do
{
→  MPI_Revc data1 from Master process.
→    MPI_Revc data from other slave processes.(the data which other clusters act on Slave
NO.1)
   MPI_Send data to all Slaves(the data which Slave NO.1 act on other clusters)
→  Get Net 1 result from optimization method
→  MPI_Send Net 1 to Master Process
}
→  If N> Max_N
do{
```

→ MPI_Revc data1 from Master process.

→ MPI_Revc data from other slave processes.(the data which other clusters act on cluster NO.1)

  MPI_Send data to all Slaves (the data which Slave clusterNO.1 act on other clusters)

→ Get Net 1 result from optimization method

→ MPI_Send Net 1 to Master Process

→ MPI_Revc data(Max_N+1)from Master process.

→ MPI_Revc data from other slave processes.(the data which other clusters act on cluster NO.(Max_N+1))

  MPI_Send data to all Slaves(the data which Slave cluster(Max_N+1)act on other clusters)

→ Get Net (Max_N+1)result from optimization method

→ MPI_Send Net (Max_N+1) to Master Process

}

Slave 2~ Max_N repeat the same operation as Slave 1.

Slave process No.2:

Slave process No.3:

…

Slave process No. Max_N