Usage Example

```
library(PROCapMultiSampleHMM)
help(PROCapMultiSampleHMM)
help(MultiSampleHMM)
help(MultiSampleHMMR)
help(ComputeDist)
help(ComputeDistR)

interval=300
binSize=10
files=c("pileups.chr19/NA18486.plp.chr19.bed", "pileups.chr19/NA18520r.plp.chr19.bed",
"pileups.chr19/NA18916.plp.chr19.bed",
    "pileups.chr19/NA19140.plp.chr19.bed", "pileups.chr19/NA19204.plp.chr19.bed",
"pileups.chr19/NA18499.plp.chr19.bed",
    "pileups.chr19/NA18522.plp.chr19.bed", "pileups.chr19/NA19092.plp.chr19.bed",
"pileups.chr19/NA19141.plp.chr19.bed",
    "pileups.chr19/NA19206.plp.chr19.bed", "pileups.chr19/NA18501.plp.chr19.bed",
"pileups.chr19/NA18522r.plp.chr19.bed",
    "pileups.chr19/NA19093.plp.chr19.bed", "pileups.chr19/NA19143.plp.chr19.bed",
"pileups.chr19/NA19207.plp.chr19.bed",
    "pileups.chr19/NA18502.plp.chr19.bed", "pileups.chr19/NA18852.plp.chr19.bed",
"pileups.chr19/NA19098.plp.chr19.bed",
    "pileups.chr19/NA19144.plp.chr19.bed", "pileups.chr19/NA19209.plp.chr19.bed",
"pileups.chr19/NA18504.plp.chr19.bed",
    "pileups.chr19/NA18853.plp.chr19.bed", "pileups.chr19/NA19099.plp.chr19.bed",
"pileups.chr19/NA19147.plp.chr19.bed",
    "pileups.chr19/NA19210.plp.chr19.bed", "pileups.chr19/NA18505.plp.chr19.bed",
"pileups.chr19/NA18855.plp.chr19.bed",
    "pileups.chr19/NA19099r.plp.chr19.bed", "pileups.chr19/NA19152.plp.chr19.bed",
"pileups.chr19/NA19222.plp.chr19.bed",
    "pileups.chr19/NA18505r.plp.chr19.bed", "pileups.chr19/NA18856.plp.chr19.bed",
"pileups.chr19/NA19101.plp.chr19.bed",
    "pileups.chr19/NA19153.plp.chr19.bed", "pileups.chr19/NA19223.plp.chr19.bed",
"pileups.chr19/NA18507.plp.chr19.bed",
    "pileups.chr19/NA18858.plp.chr19.bed", "pileups.chr19/NA19114.plp.chr19.bed",
"pileups.chr19/NA19159.plp.chr19.bed",
    "pileups.chr19/NA19225.plp.chr19.bed", "pileups.chr19/NA18508.plp.chr19.bed",
"pileups.chr19/NA18859.plp.chr19.bed",
    "pileups.chr19/NA19116.plp.chr19.bed", "pileups.chr19/NA19160.plp.chr19.bed",
"pileups.chr19/NA19238.plp.chr19.bed",
    "pileups.chr19/NA18510.plp.chr19.bed", "pileups.chr19/NA18861.plp.chr19.bed",
"pileups.chr19/NA19119.plp.chr19.bed",
```

```
    "pileups.chr19/NA19171.plp.chr19.bed", "pileups.chr19/NA19238r.plp.chr19.bed",
"pileups.chr19/NA18511.plp.chr19.bed",
    "pileups.chr19/NA18862.plp.chr19.bed", "pileups.chr19/NA19127.plp.chr19.bed",
"pileups.chr19/NA19190.plp.chr19.bed",
    "pileups.chr19/NA19239.plp.chr19.bed", "pileups.chr19/NA18516.plp.chr19.bed",
"pileups.chr19/NA18870.plp.chr19.bed",
    "pileups.chr19/NA19130.plp.chr19.bed", "pileups.chr19/NA19192.plp.chr19.bed",
"pileups.chr19/NA19239r.plp.chr19.bed",
    "pileups.chr19/NA18517.plp.chr19.bed", "pileups.chr19/NA18907.plp.chr19.bed",
"pileups.chr19/NA19131.plp.chr19.bed",
    "pileups.chr19/NA19193.plp.chr19.bed", "pileups.chr19/NA19257.plp.chr19.bed",
"pileups.chr19/NA18517r.plp.chr19.bed",
    "pileups.chr19/NA18909.plp.chr19.bed", "pileups.chr19/NA19131r.plp.chr19.bed",
"pileups.chr19/NA19200.plp.chr19.bed",
    "pileups.chr19/NA18519.plp.chr19.bed", "pileups.chr19/NA18912.plp.chr19.bed",
"pileups.chr19/NA19137.plp.chr19.bed",
    "pileups.chr19/NA19201.plp.chr19.bed", "pileups.chr19/NA18520.plp.chr19.bed",
"pileups.chr19/NA18913.plp.chr19.bed",
    "pileups.chr19/NA19138.plp.chr19.bed", "pileups.chr19/NA19203.plp.chr19.bed")
seed=815

tic <- proc.time()
d=ComputeDistR(files, interval)
toc <- proc.time()
print(toc-tic)

dist=d$optimDist

tic <- proc.time()
r=MultiSampleHMMR(binSize, dist, files, seed)
toc <- proc.time()
print(toc-tic)
```

```
> tic <- proc.time()
> d=ComputeDistR(files, interval)
> toc <- proc.time()
> print(toc-tic)
   user  system elapsed
 61.365   0.742  62.167
>
> dist=d$optimDist
> print(dist)
[1] 154
>
> tic <- proc.time()
> r=MultiSampleHMMR(binSize, dist, files, seed)
Kmeans Clustering Converged After: 19 Iterations
Kmeans Clustering Converged (Again) After: 19 Iterations
> toc <- proc.time()
> print(toc-tic)
   user  system elapsed
 89.468   1.057  90.664
>
> table(r$viterbiPath[,2])

      0       1       2
5848654   28639    6132
> head(r$condProb)
      loci noTFBSProb variantTFBSProb sharedTFBSProb
[1,] 26205  1.0000000    6.340006e-09   6.514091e-09
[2,] 26206  0.9999983    6.495581e-07   1.002972e-06
[3,] 26207  0.9999983    6.495613e-07   1.002987e-06
[4,] 26208  0.9999983    6.495613e-07   1.002987e-06
[5,] 26209  0.9999983    6.495613e-07   1.002987e-06
[6,] 26210  0.9999983    6.495613e-07   1.002987e-06
```