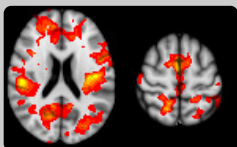
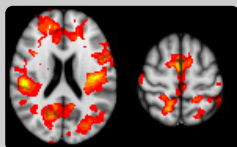


Reference set



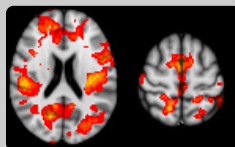
$J = 50000$
elapsed time: 20683.9 s

No permutation



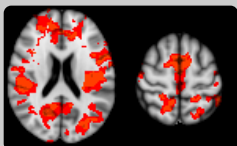
$J = (\text{none})$
elapsed time: 228.6 s

Low rank completion

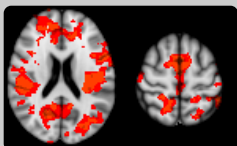


$v = 1275, J = 5000$
elapsed time: 9760.0 s

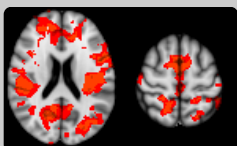
Few permutations



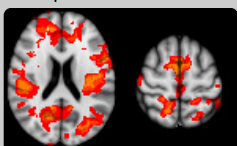
$J = 100$
elapsed time: 46.2 s



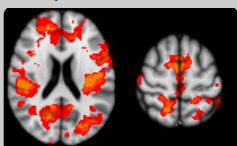
$J = 200$
elapsed time: 87.5 s



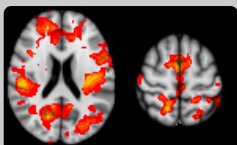
$J = 300$
elapsed time: 128.5 s



$J = 500$
elapsed time: 211.0 s

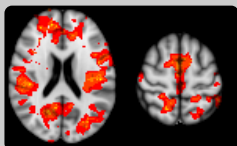


$J = 1000$
elapsed time: 416.7 s

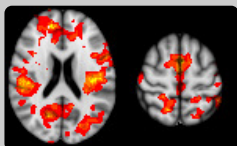


$J = 5000$
elapsed time: 2066.8 s

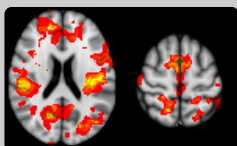
Tail approximation



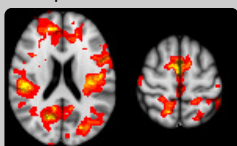
$J = 100$
elapsed time: 154.4 s



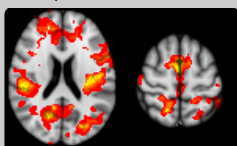
$J = 200$
elapsed time: 215.2 s



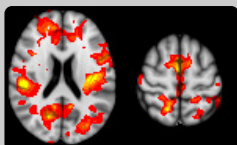
$J = 300$
elapsed time: 269.0 s



$J = 500$
elapsed time: 381.5 s

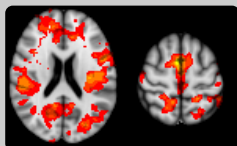


$J = 1000$
elapsed time: 623.8 s

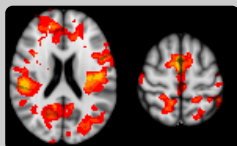


$J = 5000$
elapsed time: 2875.2 s

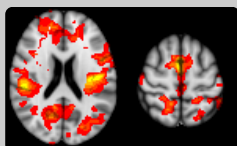
Gamma approximation



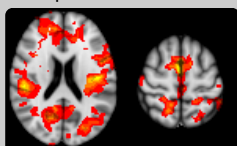
$J = 100$
elapsed time: 66.2 s



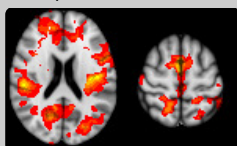
$J = 200$
elapsed time: 112.6 s



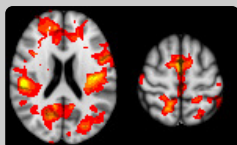
$J = 300$
elapsed time: 157.5 s



$J = 500$
elapsed time: 244.7 s

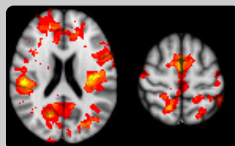


$J = 1000$
elapsed time: 475.5 s

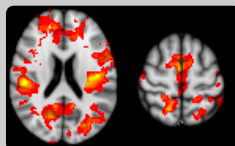


$J = 5000$
elapsed time: 2261.1 s

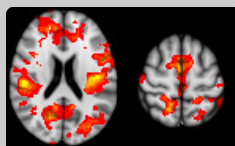
Negative binomial



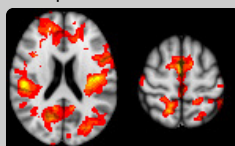
$n = 2$
elapsed time: 158.2 s



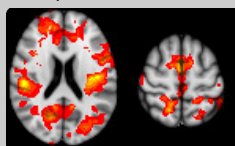
$n = 5$
elapsed time: 202.0 s



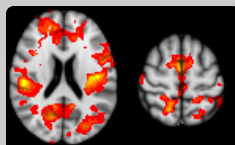
$n = 10$
elapsed time: 273.4 s



$n = 20$
elapsed time: 384.4 s



$n = 50$
elapsed time: 678.2 s



$n = 100$
elapsed time: 1073.4 s

1.3  4.7

$-\log_{10}(p)$