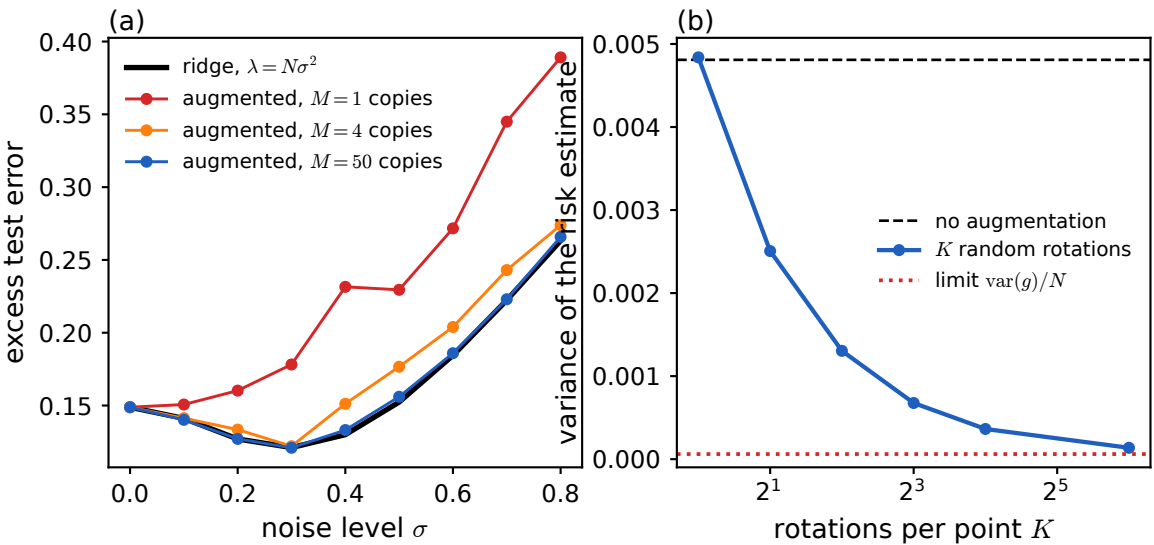

(a)
ridge, $\lambda = N\sigma^2$
augmented, $M = 1$ copies
augmented, $M = 4$ copies
augmented, $M = 50$ copies
excess test error
noise level σ
0.40
0.35
0.30
0.25
0.20
0.15
0.0
0.2
0.4
0.6
0.8
(b)
variance of the risk estimate
no augmentation
K random rotations
limit $\mathrm{var}(g)/N$
rotations per point K
0.005
0.004
0.003
0.002
0.001
0.000
2^1
2^3
2^5