

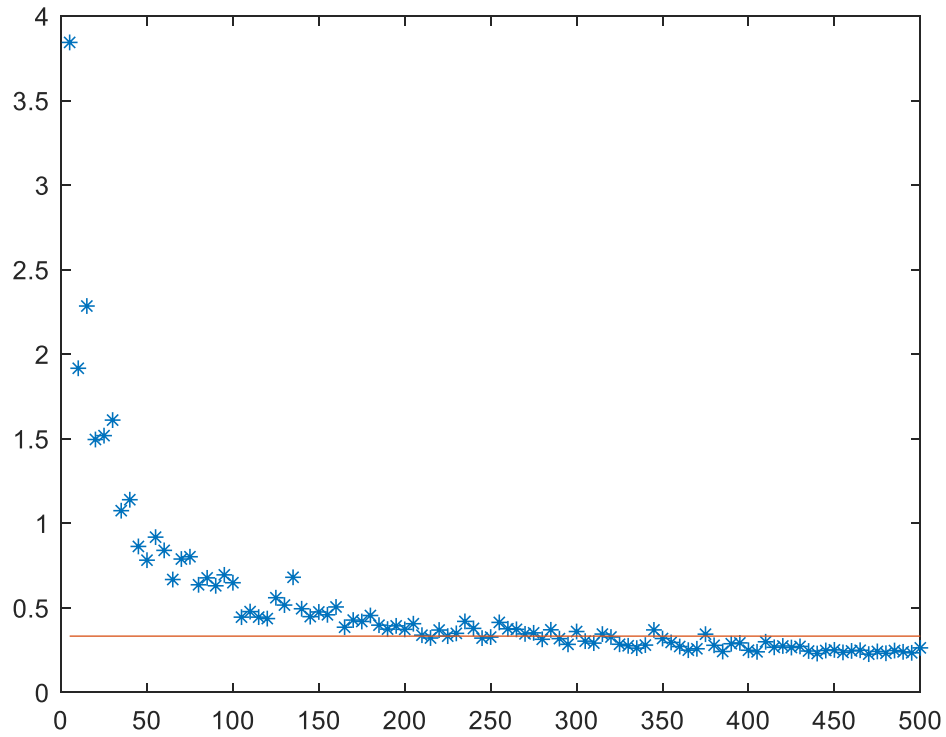
Xiang Zhang

Project #3 JL lemma

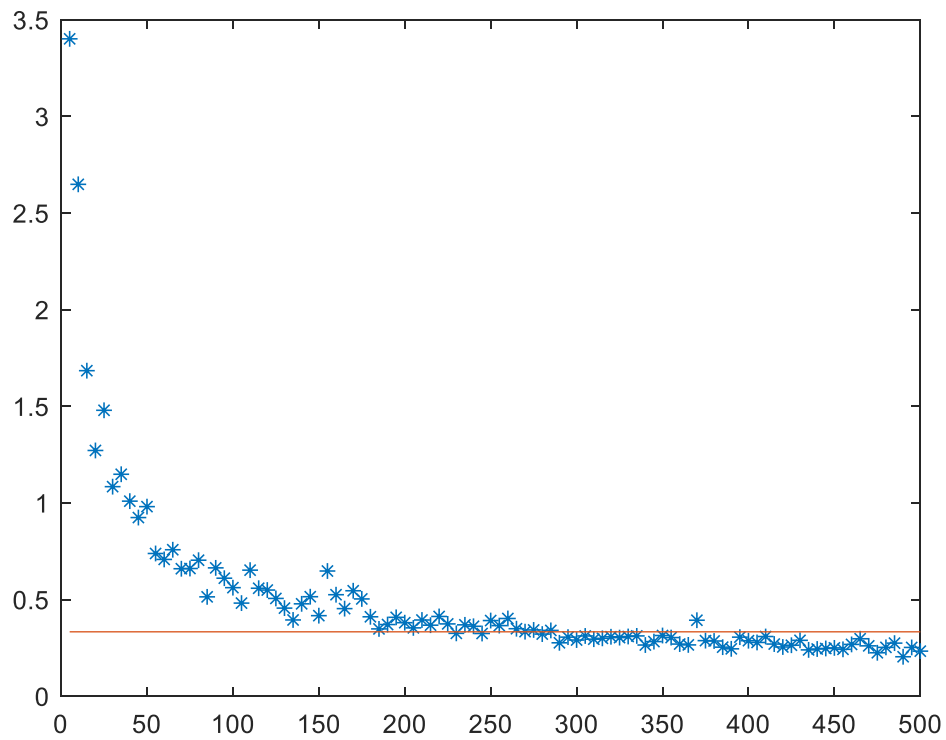
Theoretical bound=427

d=1000 (stepsize=5)

realization #1, k=380

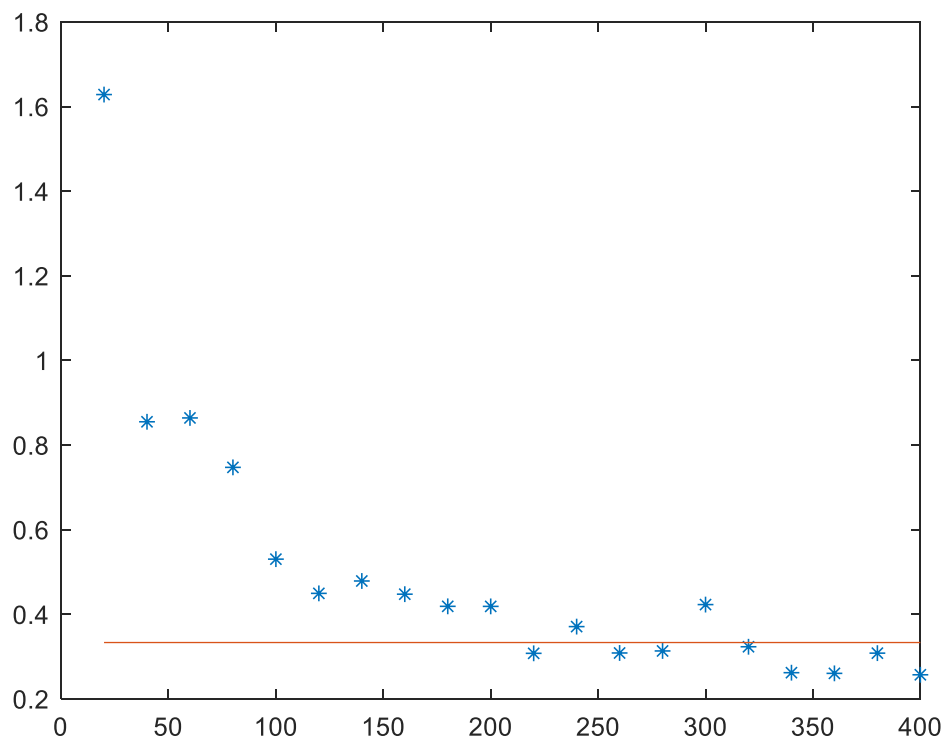


realization #2, k=375

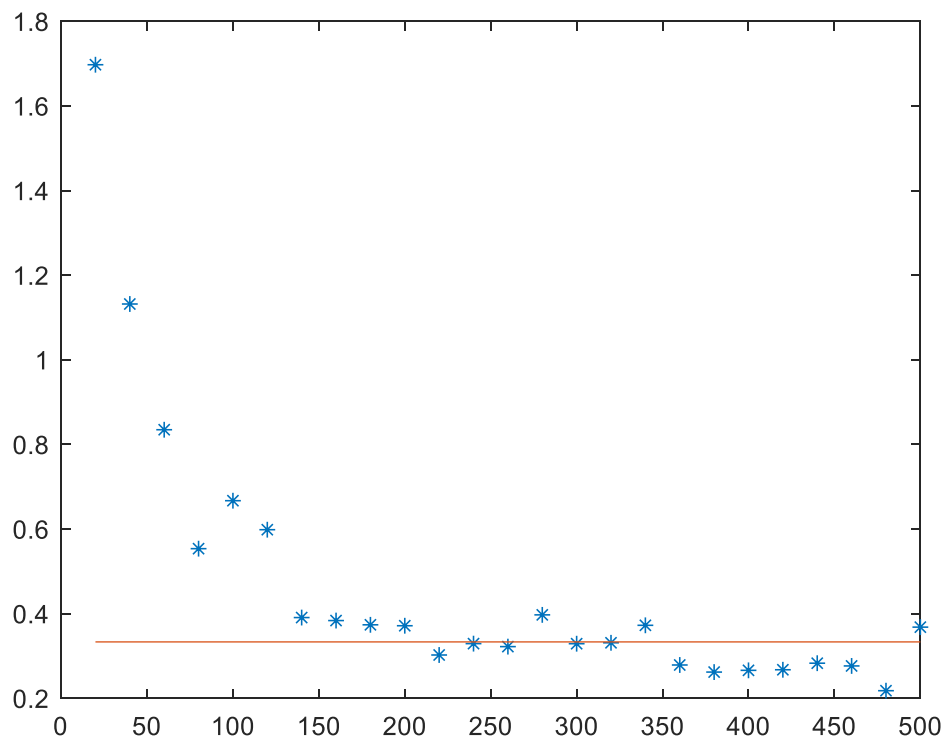


Xiang Zhang
d=10000 (stepsize=20)

k=320

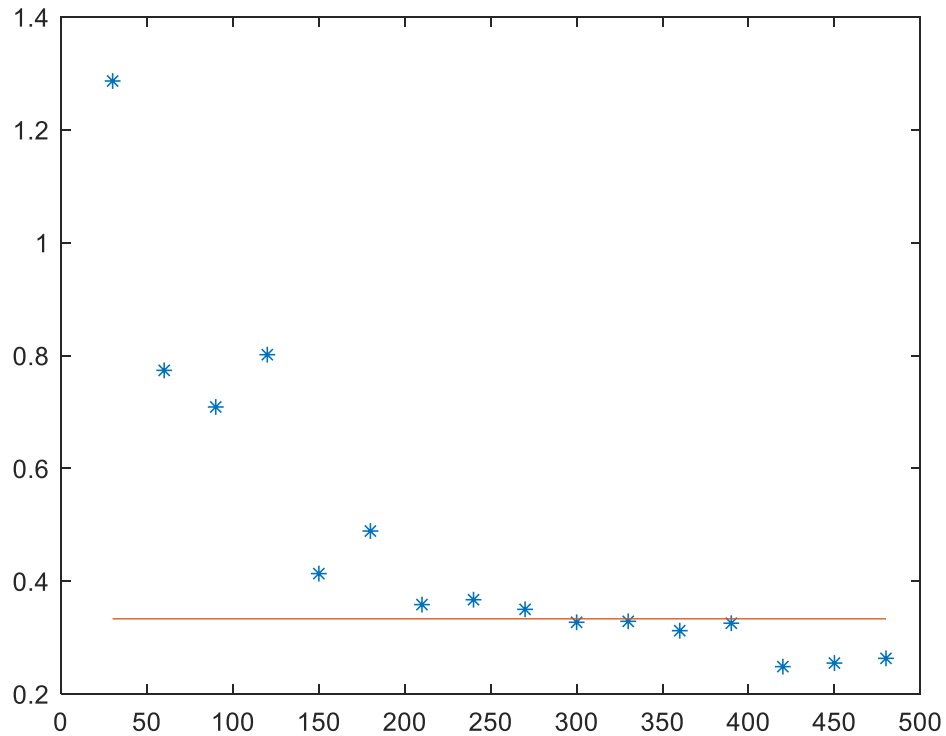


k=360



d=20000 (stepsize=30)

k=360



[Interpretation]

Form the above figures we see that the reduced dimension k that preserves the distance at level $1/3$ has nothing to do with the original data dimension d . The lower bound only guarantees the existence of projection matrices that preserves distance for any set of n points, but says nothing about the minimum k for a given set of points such that the distance is preserved.