

Sketches for Polynomial Kernels

• Ahlert et al.'20 give a fast sketch construction for polynomial kernels

- For $p = 2$
 - S_1 and S_2 be Gaussian matrices
 - $Q' = (QS_1) * (QS_2)$ (* denotes hadamard product)

• Given any Q and K , if # of columns in S_1 and S_2 is large enough, with a high probability

- Similar extensions to larger powers p



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For $p = 4$

$$Q' = Q^{\otimes 4} \cdot S$$

