

### 3

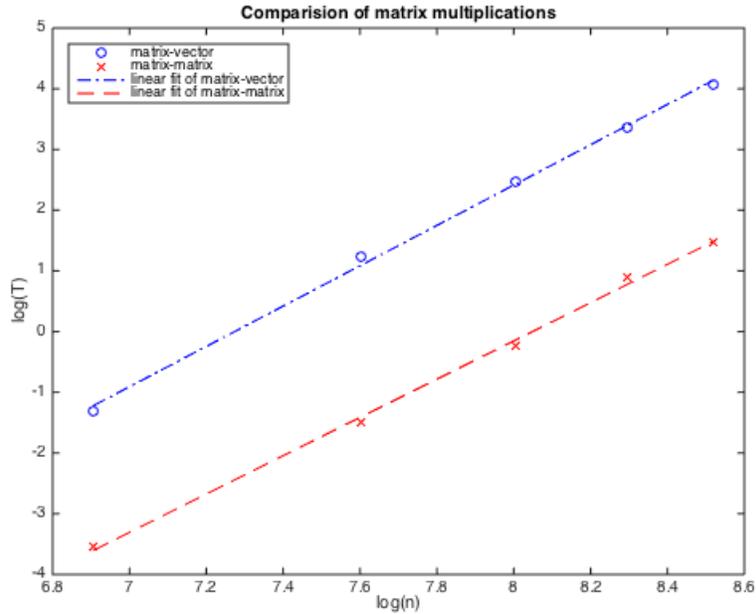


Figure 1: Comparison of matrix multiplications

All results are obtained by running a Matlab implementation on a macintosh laptop with Intel i7 2.3 GHz processor, with no parallelization.

The slopes of linear fitting lines in figure 1 are 3.1538 and 3.3213 for 'matrix-vector' and 'matrix-matrix' respectively, which shows that both of them are of  $\mathcal{O}(n^3)$ . The constant for 'matrix-vector' is 3.2261E-11, and the constant for 'matrix-matrix' is 9.4734E-12.

The slopes of the three linear fitting lines in figure 2 are 2.6202, 2.7455 and 2.9631 for LU, QR and SVD respectively. It shows that each of them is of  $\mathcal{O}(n^3)$ . The constants for LU, QR and SVD decomposition are 4.5422E-10, 6.5493E-10 and 1.1280E-9 respectively.

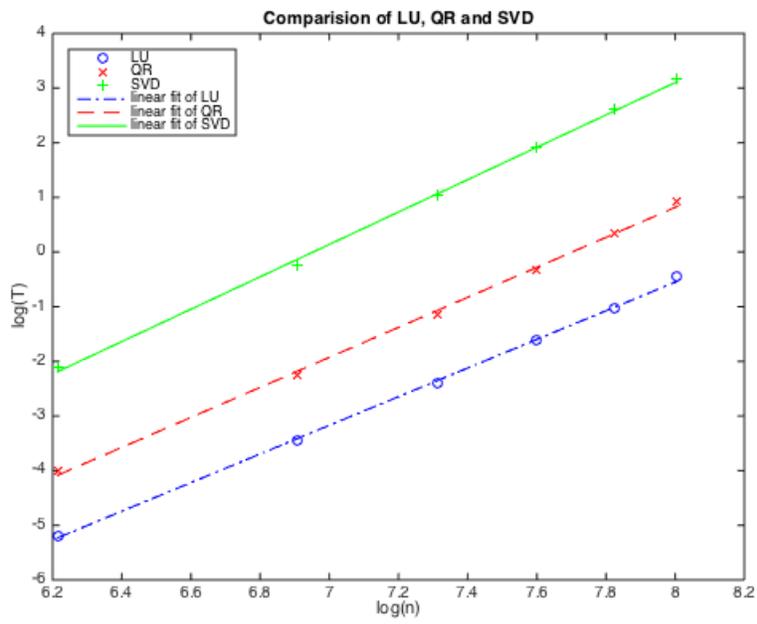


Figure 2: Comparison of LU, QR and SVD