QR Factorization and Least Squares Problem

Arda Tiftikçi

January 18, 2022

my_qr.m is designed for finding QR factorization of a matrix. The time complexity of the algorithm is $O(n)$, it exploits properties of tridiagonal matrix. least_squares_solution.m is designed for finding a solution to Least Squares Problem $Ax = b$ by using QR decomposition in the following way.

$$R\hat{x} = Q^T b$$

application.m is designed for finding the best quadratic fit to the following system of equations ($l(s) = x_1 + x_2 s + x_3 s^2$).

$$l(0.2) = 48.1$$

$$l(0.4) = 54.9$$

$$l(0.6) = 60.2$$

$$l(0.8) = 64.2$$

$$l(1) = 69.0$$

It makes use of least_squares_solution.m