BENESCO Lecture Series on
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Matrix calculus – an introduction using Matlab

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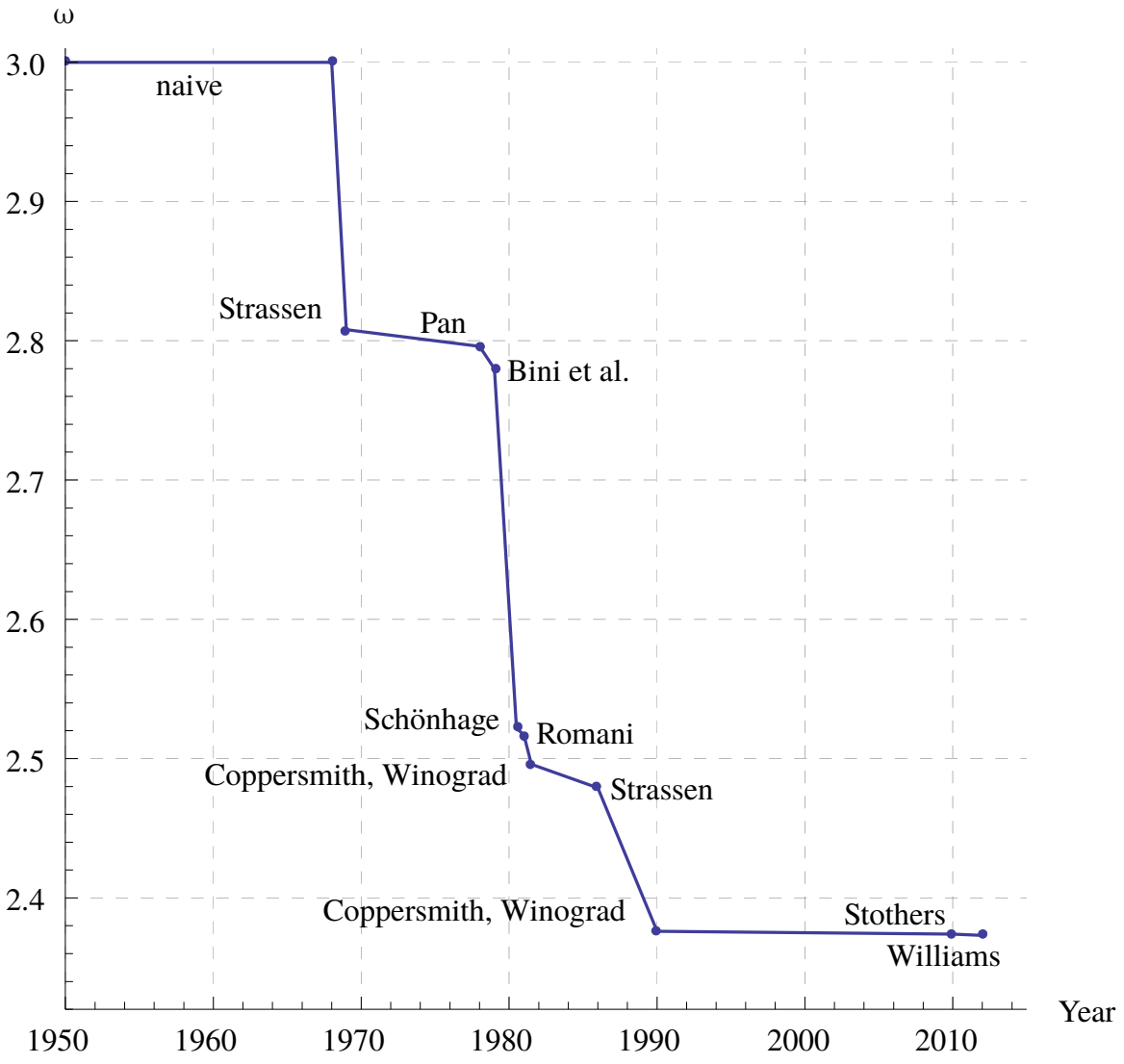
Algorithms for Matrix Multiplication



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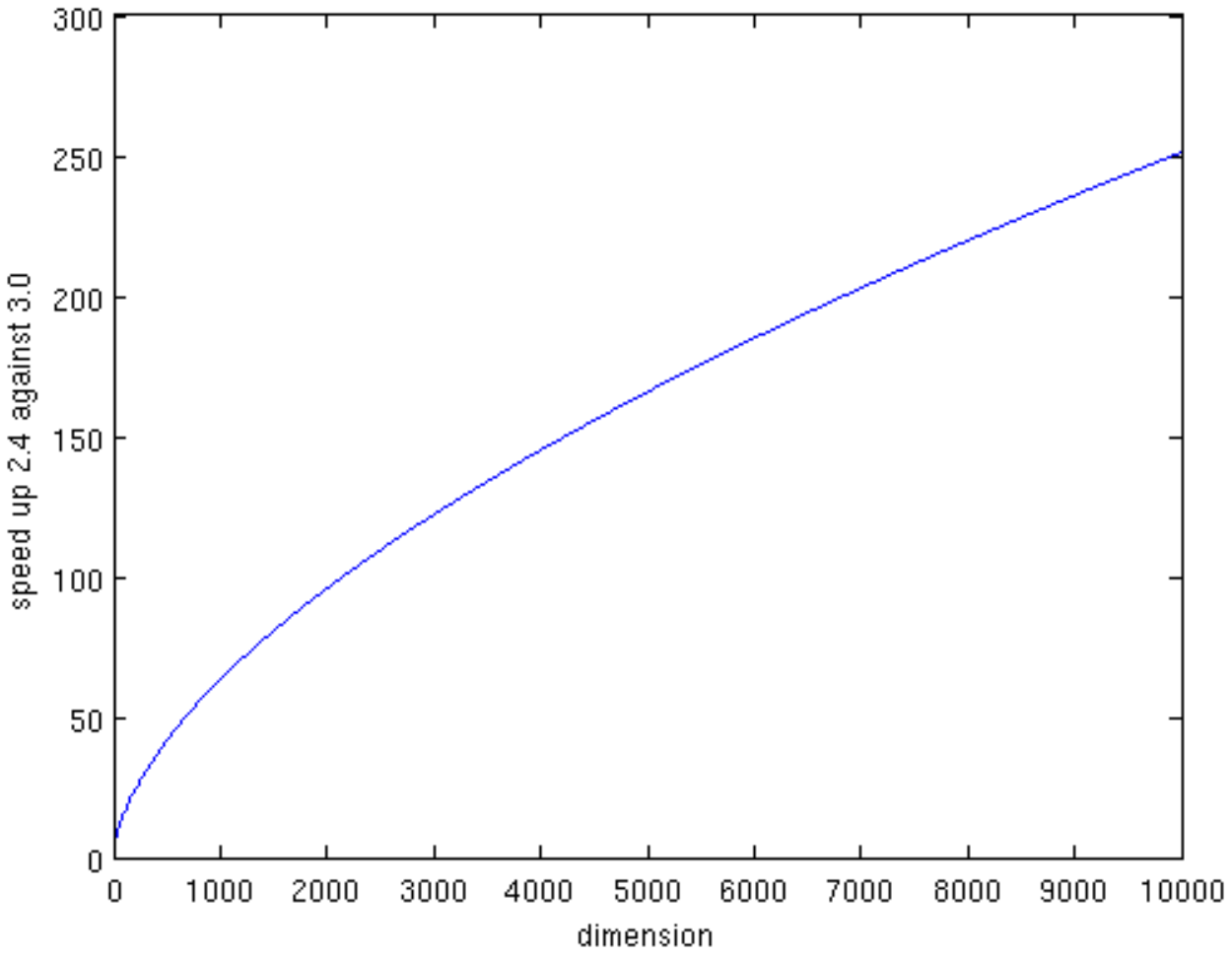

Literature

K. Meyberg & P. Vachenauer, Höhere Mathematik 1, Springer

I. Markov, Introduction to matrix calculus
http://w3.uacg.bg/UACEG_site/acadstaff/userfiles/study_bg_162_Matrix_PDF_Engl.pdf

Homework

A) Write a short Matlab script to solve the following tasks:

1) generate a random matrix of dimensions 50*20 with elements drawn from a normal distribution
2) use *loops* to set all elements with |a| ≤ 1 to zero, check the required time
3) do the same task *without* using loops, check the required time
4) display the original matrix together with the results of 2) and 3) to check that they are really equal
5) rerun the same script for dimension 5000*2000

Homework

B) Write a short Matlab script to rerun the following instructions 20 times:

1) generate a random matrix of dimensions 5000*2000 with elements drawn from a normal distribution
2) use *loops* to set all elements with |a| ≤ 1 to zero, check the required time
3) do the same task *without* using loops, check the required time
4) repeat steps 2) and 3) for the *transposed* matrix

Answer the following questions:

a) Is the vectorized version significantly faster than the loops?
b) Do vectorized and looped variants differ between the original and the transposed matrix?