3.4.1 Via dot products

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Week 3 due Oct 18, 2023 06:12 IST

3.4.1 Via dot products

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3.4.1 Errors in arithmetic

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discussion posted about 4 hours ago by **UnkleRhaukus**

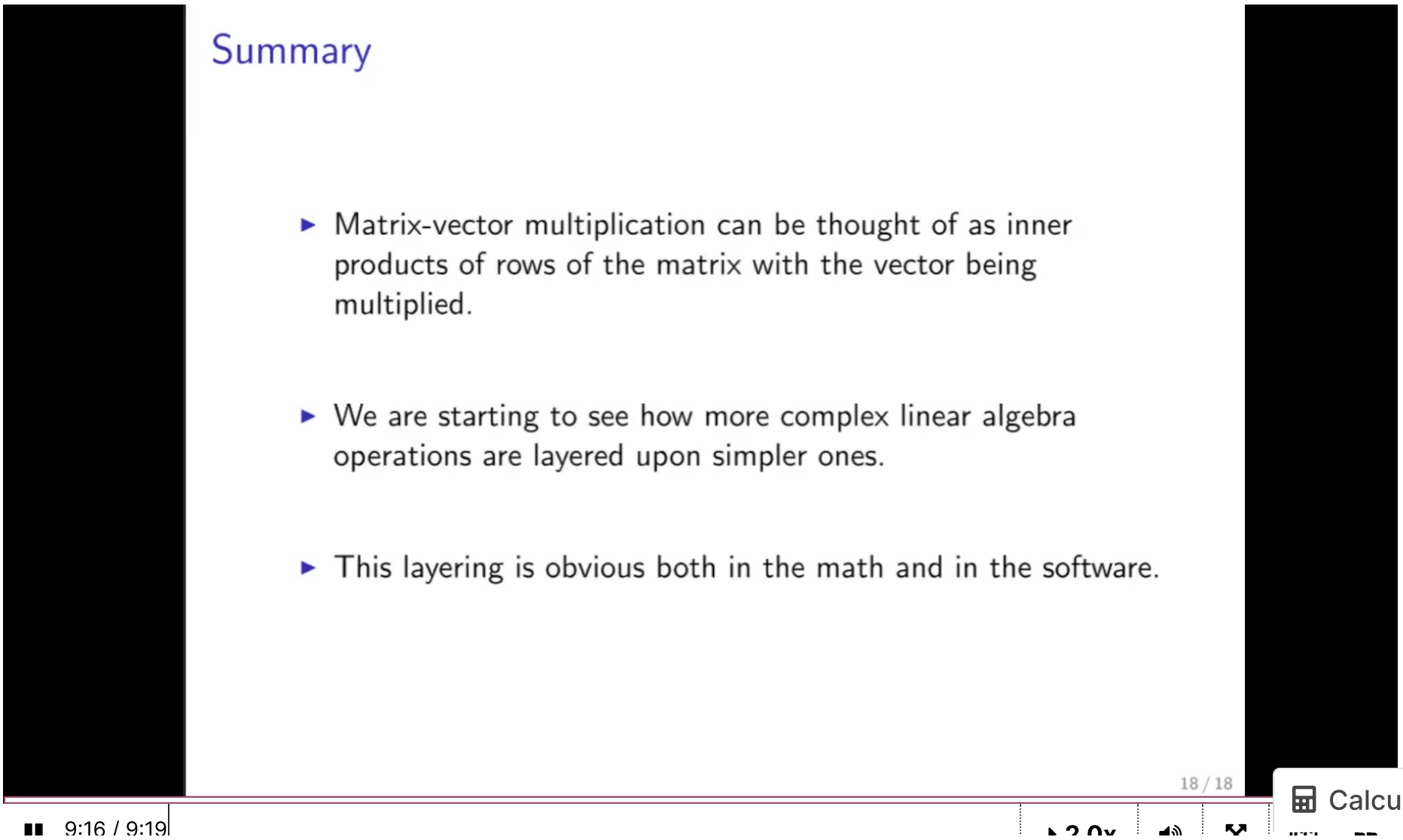
In the video of 3.4.1 at 3:00, there are arithmetic errors

$$\left(\begin{array}{ccc} -1 & 0 & 2 \\ \hline 2 & -1 & 1 \\ \hline 3 & 1 & -1 \end{array}\right)\begin{pmatrix} -1 \\ 2 \\ 1 \end{pmatrix} = \left(\begin{array}{c} \dfrac{\begin{pmatrix} -1 & 0 & 2 \end{pmatrix}\begin{pmatrix} -1 \\ 2 \\ 1 \end{pmatrix}}{\begin{pmatrix} -1 \end{pmatrix}} \\ \hline \dfrac{\begin{pmatrix} 2 & -1 & 1 \end{pmatrix}\begin{pmatrix} -1 \\ 2 \\ 1 \end{pmatrix}}{\begin{pmatrix} -1 \end{pmatrix}} \\ \hline \dfrac{\begin{pmatrix} 3 & 1 & -1 \end{pmatrix}\begin{pmatrix} -1 \\ 2 \\ 1 \end{pmatrix}}{\begin{pmatrix} -1 \end{pmatrix}} \end{array}\right) = \begin{pmatrix} 1+0+2 \\ -2-2+1 \\ -3+2-1 \end{pmatrix}$$

$$= \begin{pmatrix} 3 \\ -3 \\ -2 \end{pmatrix}$$

$$\neq \begin{pmatrix} 4 \\ 1 \\ -2 \end{pmatrix}$$

(this post is about Week 3 / 3.4.1)



Video

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Reading Assignment

0 points possible (ungraded)

Read Unit 3.4.1 of the notes. [LINK]

Done

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Correct

Discussion

Topic: Week 3 / 3.4.1

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?	Partitioning "x"? — I was getting a number of columns error until I deleted the partitioning of x and changed the function to read: psi1 = laff_dot(a1t, x) + psi1; Then i...	2
	Matrix Vector Multiple — Hi I have not understand why test the Home work 3.4.1.1 Function Mvmult_n_unb_var1(A,x,y) . it show the result difference from on paper . I chos...	3
	Incorrect Arithmetic? — When the matrix - vector multiplication at time ~ 3:20 is carried out, I get the vector (3 -3 -2) rather than (4 1 -2). Is this correct?	2
?	Issue with function solution — Hi Robert & Maggie, I was looking at the algorithms document linked to in the solution. The algorithm for matrix vector multiplication uses the laf...	2

Homework 3.4.1.1

1/1 point (graded)

Implement the function

```
function [ y_out ] = Mvmult_n_unb_var1( A, x, y )
```

that corresponds to the algorithm

Algorithm: $y := \text{MVMULT\_N\_UNB\_VAR1}(A, x, y)$

Partition $A \rightarrow \left(\frac{A_T}{A_B}\right)$, $y \rightarrow \left(\frac{y_T}{y_B}\right)$

where A_T is $0 \times n$ and y_T is 0×1

while $m(A_T) < m(A)$ **do**

Repartition

$$\left(\frac{A_T}{A_B}\right) \rightarrow \left(\frac{A_0}{a_1^T}{A_2}\right), \left(\frac{y_T}{y_B}\right) \rightarrow \left(\frac{y_0}{\psi_1}{y_2}\right)$$

where a_1 is a row

Calculator

$\psi_1 := a_1^T x + \psi_1$

Continue with

$$\left(\frac{A_T}{A_B}\right) \leftarrow \left(\frac{A_0}{\frac{a_1^T}{A_2}}\right), \left(\frac{y_T}{y_B}\right) \leftarrow \left(\frac{y_0}{\frac{\psi_1}{y_2}}\right)$$

endwhile

Some links that will come in handy:

- Spark (alternatively, open the file `LAFF-2.0xM/Spark/index.html`)
- PictureFLAME (alternatively, open the file `LAFF-2.0xM/PictureFLAME/PictureFLAME.html`)

☑ Done/Skip

✔

Answer:

- View a document that we put together that has most algorithms and MATLAB implementations that are homework problems in this week:

  Week 3 algorithms and implementations .

  This document is best viewed two pages, side by side, so that you can see the algorithm on the left and its implementation on the right.

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