3.2.1 The Zero Matrix

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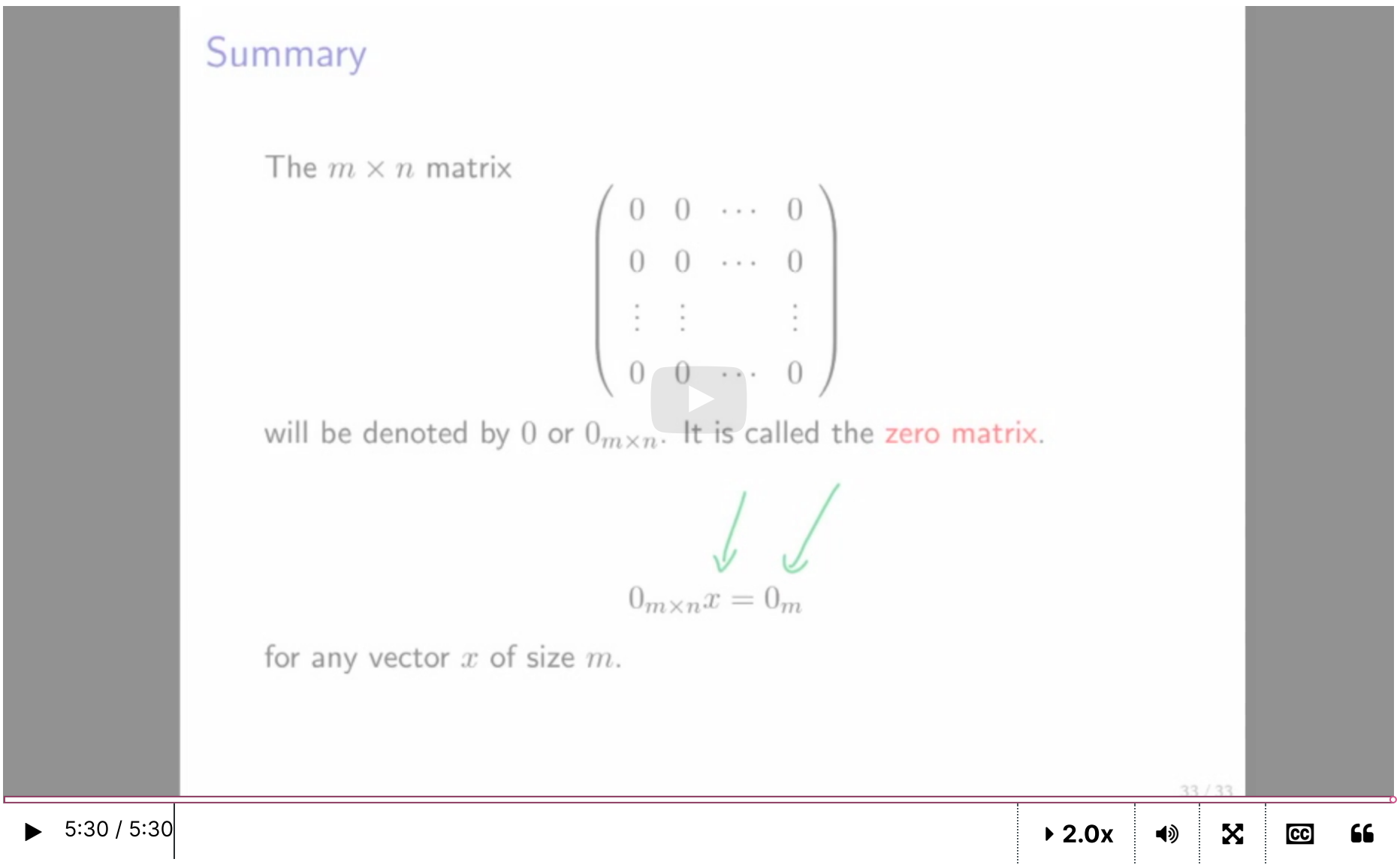
Week 3 due Oct 18, 2023 06:12 IST

3.2.1 The Zero Matrix



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Reading Assignment

0 points possible (ungraded)

Read Unit 3.2.1 of the notes. [LINK]

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The Zero Matrix on Picture Flame — 4
I try to copy the code from Matlab of Zero_maxtric to show Picture Flame to run but it no show like in video to generate the martrix and click ne...

PictureFLAME Quirk - Use a semicolon! — 2
I noticed that for problem 3.2.1.2 in PictureFLAME, the matrix does not update if you lack a semicolon after 'a1 = laff_zerov(a1)'. With the semicol...

Homework 3.2.1.1

1/1 point (graded)

Let $L_0 : \mathbb{R}^n \rightarrow \mathbb{R}^m$ be the function defined for every $x \in \mathbb{R}^n$ as $L_0(x) = 0$ where 0 denotes the zero vector "of appropriate size".

L_0 is a linear transformation.

TRUE ✔ Answer: TRUE

Explanation

Answer: True

- $L_0(\alpha x) = 0 = \alpha 0 = \alpha L_0(0) = \alpha L_0(x).$
- $L_0(x+y) = 0 = 0+0 = L_0(x) + L_0(y).$

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Answers are displayed within the problem

Homework 3.2.1.2

1/1 point (graded)

With the FLAME@lab API, write a function `[ A_out ] = ZeroMatrix_unb( A )` that sets the entries of a given matrix to zero, one column at a time, based on the algorithm

Algorithm: $[A] := \text{SET\_TO\_ZERO}(A)$

Partition $A \rightarrow \left(A_L \mid A_R \right)$
where A_L has 0 columns

while $n(A_L) < n(A)$ **do**

Repartition

$$\left(A_L \mid A_R \right) \rightarrow \left(A_0 \mid a_1 \mid A_2 \right)$$
where a_1 has 1 column

$a_1 := 0$ (Set the current column to zero)

Continue with

$$\left(A_L \mid A_R \right) \leftarrow \left(A_0 \mid a_1 \mid A_2 \right)$$

endwhile

You will use the function `laff_zerov( x )`, which returns a zero vector of the same size and shape (column or row) as input vector `x`. Check if that routine is in directory

`LAFF-2.0xM/Programming/laff/vecvec`

(in file `laff_zerov.m`). If not, download it into that file from HERE and place it in that directory, in file `laff_zerov.m`. Since you are still getting used to programming with MATLAB and FLAME@lab, you will want to follow the instructions in th
below this homework.

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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`)

You will need these in many future exercises. Bookmark them!

☑ Done/Skip

✔

Answer:

- See below video
- 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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ℹ Answers are displayed within the problem

If you get an error like

```
ZeroMatrix_unb( A ) Undefined function 'FLA_Part_1x2' for input arguments of type 'double'.
```

you need to set your path in MATLAB. Revisit the instructions in Unit 1.6.3 .

Homework 3.2.1.2 Instructions

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Homework 3.2.1.3

1/1 point (graded)

In the MATLAB Command Window, type

```
A = zeros( 5,4 )
```

What is the resulting matrix?

- ○ $\begin{matrix} 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 \end{matrix}$
- ◉ $\begin{matrix} 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \end{matrix}$
- ○ $\begin{matrix} 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 \end{matrix}$
- ○ None of the above

✔

The result is

```
>> zeros( 5, 4)

ans =

     0     0     0     0
     0     0     0     0
     0     0     0     0
     0     0     0     0
     0     0     0     0
```

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Answers are displayed within the problem

Homework 3.2.1.4

1/1 point (graded)

Apply the zero matrix to Timmy Two Space. What happens?

- ○ Timmy shifts off the grid.

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- (●) Timmy disappears into the origin.
- ( ) Timmy becomes a line of the x-axis.
- ( ) Timmy becomes a line of the y-axis.
- ( ) Timmy doesn't change at all.

✔

Explanation
Notice that Timmy disappears... He has been sucked into the origin...

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