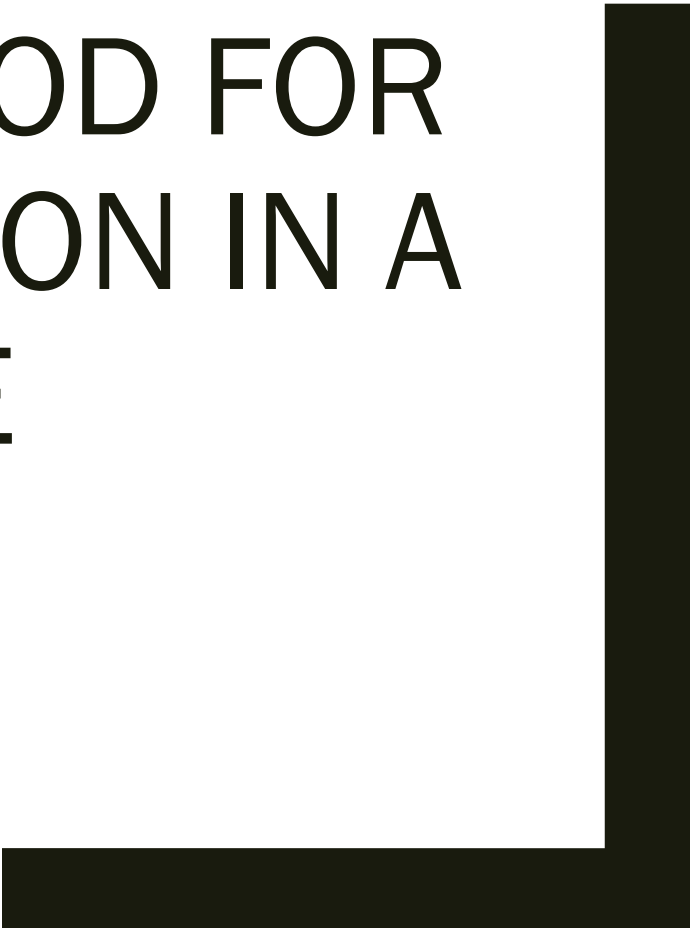




AN ALTERNATE METHOD FOR PROJECT PRESENTATION IN A MATH COURSE

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Where Am I?

- I teach at Iona College in New Rochelle, NY.
 - *Small-ish (~3000 undergraduates).*
 - *Catholic, Liberal Arts*
- The Math Department
 - *Not too many majors/minors*
 - *Small upper-level courses (8-15 students/class)*
 - *These upper-level courses have a varied audience.*

Why did I need a different method of presentation?

- Courses: Differential Equations (Spring 2019) and Linear Algebra (Spring 2018).
- Projects exploring applications are interesting.
- Time is ALWAYS an issue (for me!).

What did I want in this project presentation?

- A visual component.
- An oral component.
- A feedback component.
- Can be done completely outside of class.

The Solution?

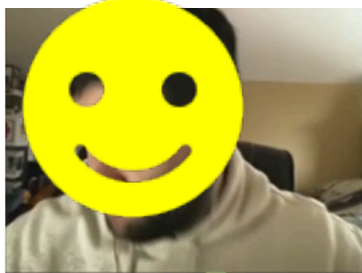
Pre-recorded presentation that is uploaded to Blackboard's Discussion section.

- Visual- Needed slides or something of the sort.
- Audio- Presentation required an oral presentation that went beyond reading the slides.
- Feedback- Students were required to watch each other's presentations and provide at least one question or comment on the discussion board for each presentation.

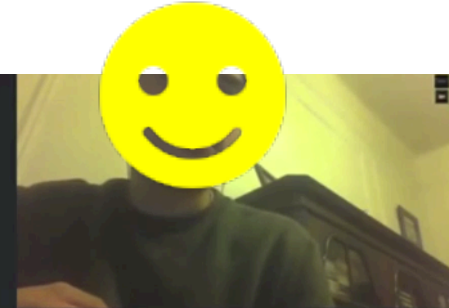
Examples

- Linear Algebra in Video Games

Linear Algebra in Video Games



roduction



- Matrices and Vectors both used heavily in computer graphics
 - Animation, Modeling, Movies, etc.
- Formerly done by hand
- Matrices are used to represent and manipulate a polygonal figure
- An understanding of Linear Algebra is essential to programming video games

Examples

- Linear Algebra in Video Games
- Cryptography and Error Correction in Linear Algebra

Example: Encoding Information

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
8	7	5	13	9	16	18	22	4	23	11	3	21	1	6	15	12	19	2	14	17	20	25	24	10	26

- Above is an alphabet where each letter corresponds to a number
- Our matrix X , will be DRBISHOP with any extra space in the matrix getting a 0 value
- The key matrix K , will be random values known by authorized users

$$X = \begin{bmatrix} D & R & B \\ I & S & H \\ O & P & 0 \end{bmatrix} = \begin{bmatrix} 13 & 19 & 7 \\ 4 & 2 & 22 \\ 6 & 15 & 0 \end{bmatrix}$$

$$K = \begin{bmatrix} 2 & 0 & 1 \\ 1 & 0 & 1 \\ 0 & 1 & 0 \end{bmatrix}$$



Examples

- Linear Algebra in Video Games
- Cryptography and Error Correction in Linear Algebra
- Differential Equations of Bungee Jumping

Differential Equations of Bungee Jumping



Feedback Portion

RE: Linear Algebra in Video Games

I liked your presentation. I thought it flowed well. I knew that linear algebra was involved in graphics, but was not aware of how involved it really is for video games. For more modern video games being played on high resolution systems and tvs where you can see minute details, does the number of calculations per movement remain constant or does it increase?

RE: Bungee Jumping

unique method of presentation. the different forms of damping is very useful and informative especially when knowing which is best for bungee jumping. if the bungee is critically damped or over damped, what would happen to the cord or jumper?



THANK YOU!

Questions?