



# **MCHE 485:**

# **Mechanical Vibrations**

## **Spring 2019**

**Dr. Joshua Vaughan**

Rougeou 225

`joshua.vaughan@louisiana.edu`

@Doc\_Vaughan

# First, Some Info on Me



- Grew up in Southern Virginia
- Bachelor's from Hampden-Sydney College in May 2002
  - Double Major: Physics and Applied Math





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- Grew up in Southern Virginia
- Bachelor's from Hampden-Sydney College in May 2002
  - Double Major: Physics and Applied Math
  - 4-year starting pitcher





# Grad. School



- Graduate School at Georgia Tech
  - Advisor: Dr. William Singhose
  - M.S. in May 2004
    - ♦ Thesis: *Active and Semi-Active Control to Counter Vehicle Payload Variation*
  - Ph.D. in August 2008
    - ♦ Thesis: *Dynamics and Control of Mobile Cranes*

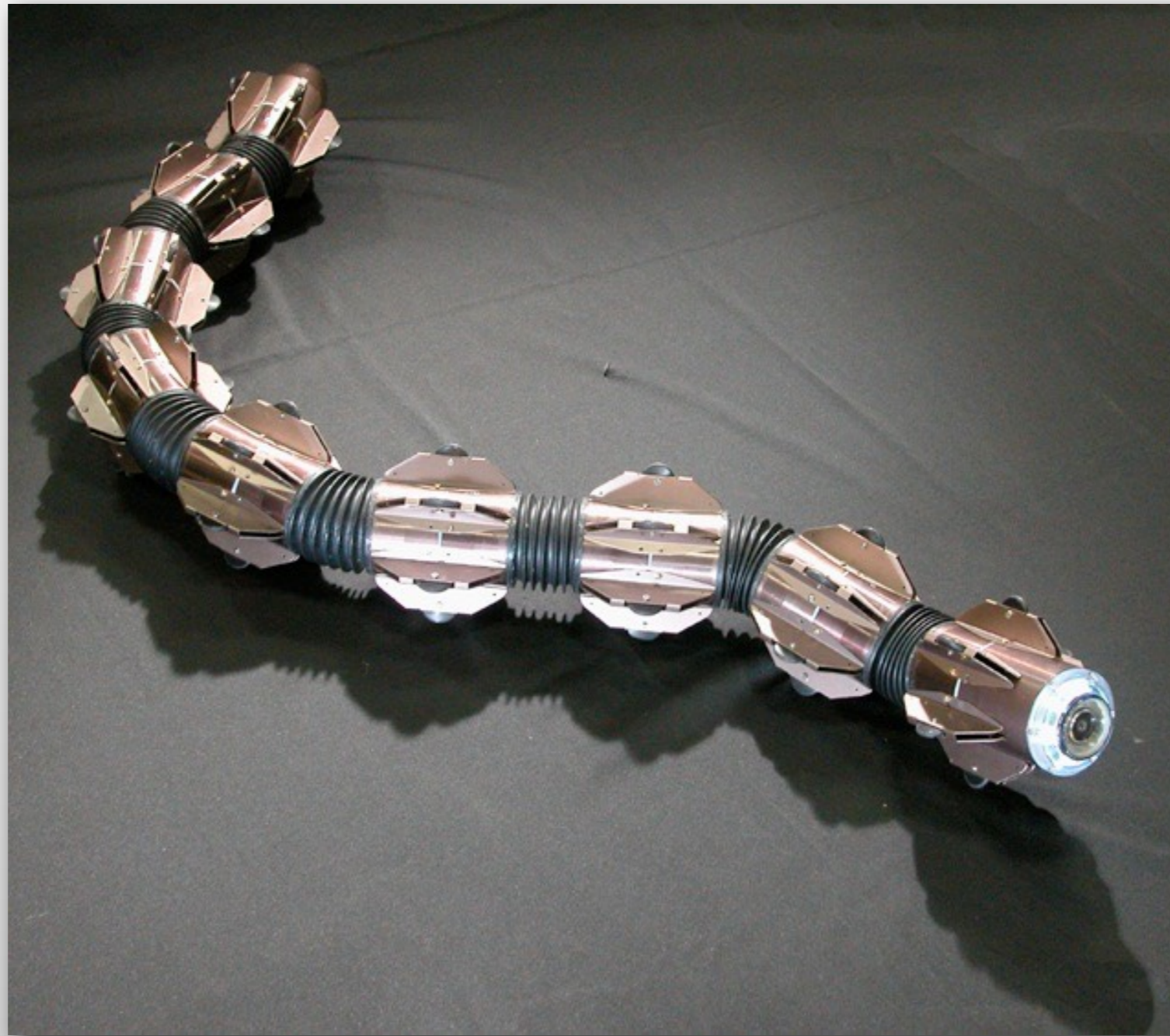




# Postdoc

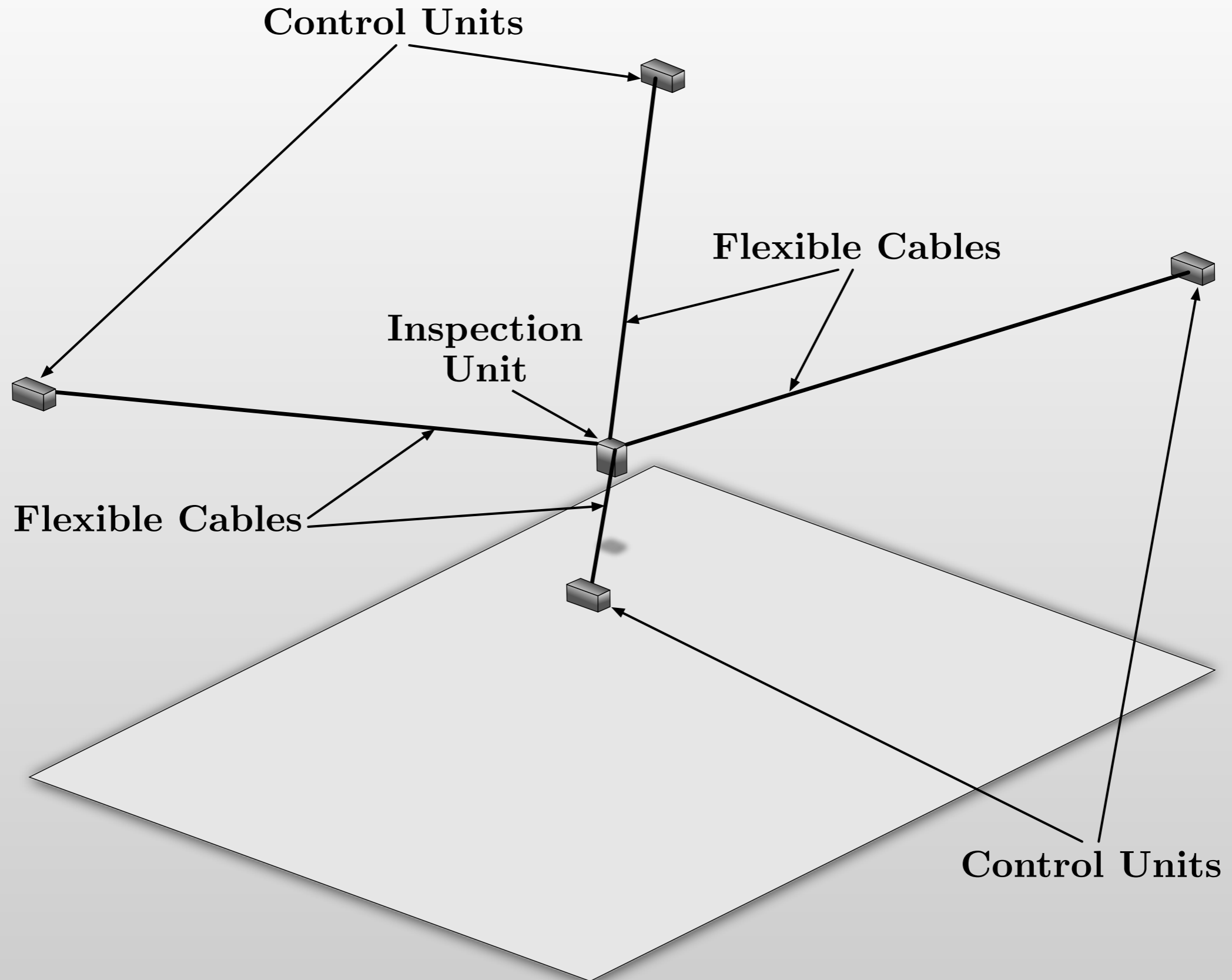


- Tokyo Institute of Technology
- Lab of Dr. Shigeo Hirose



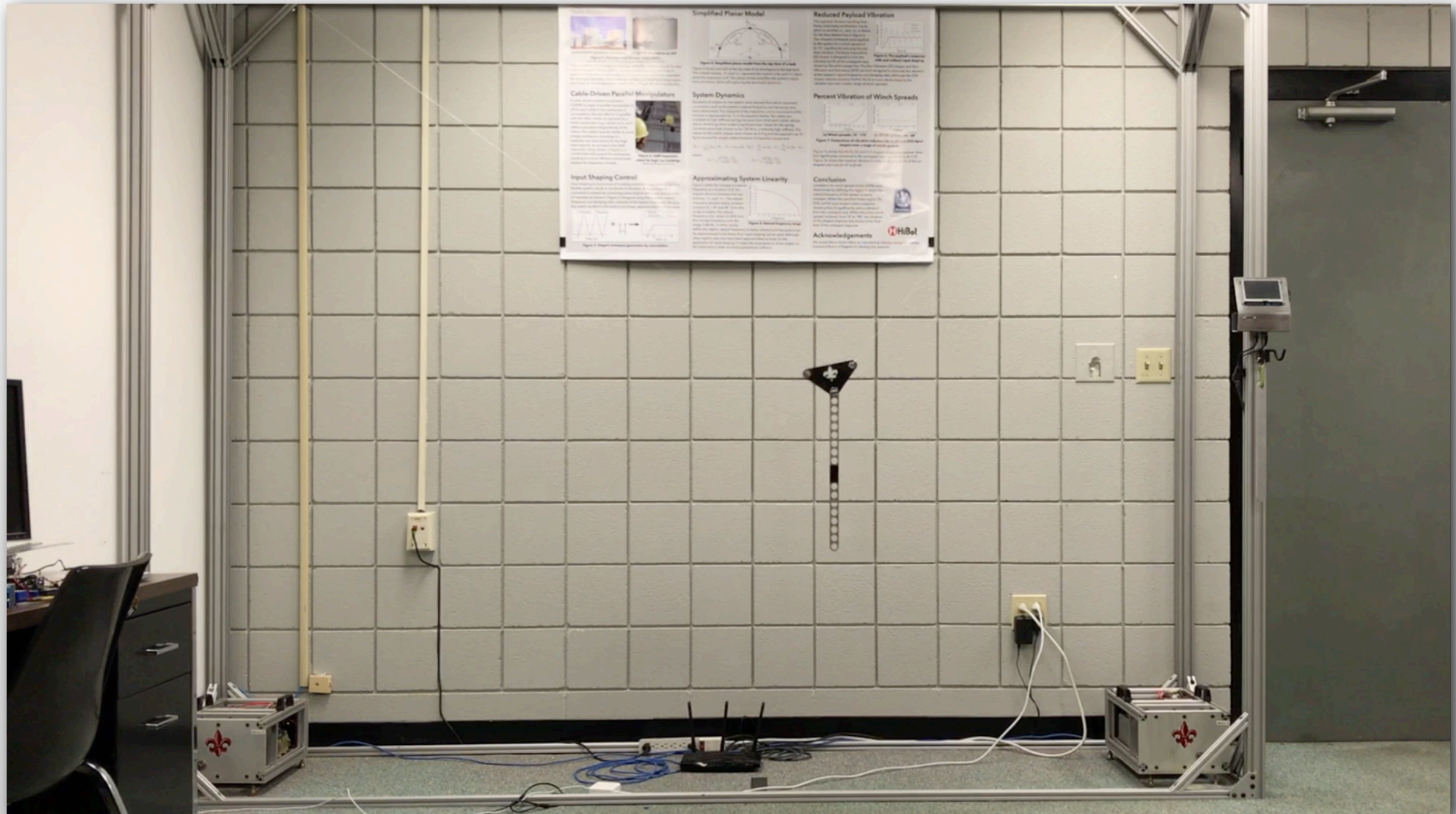


# Cable-driven-parallel-manipulators (CDPMs)





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# Walking Robots



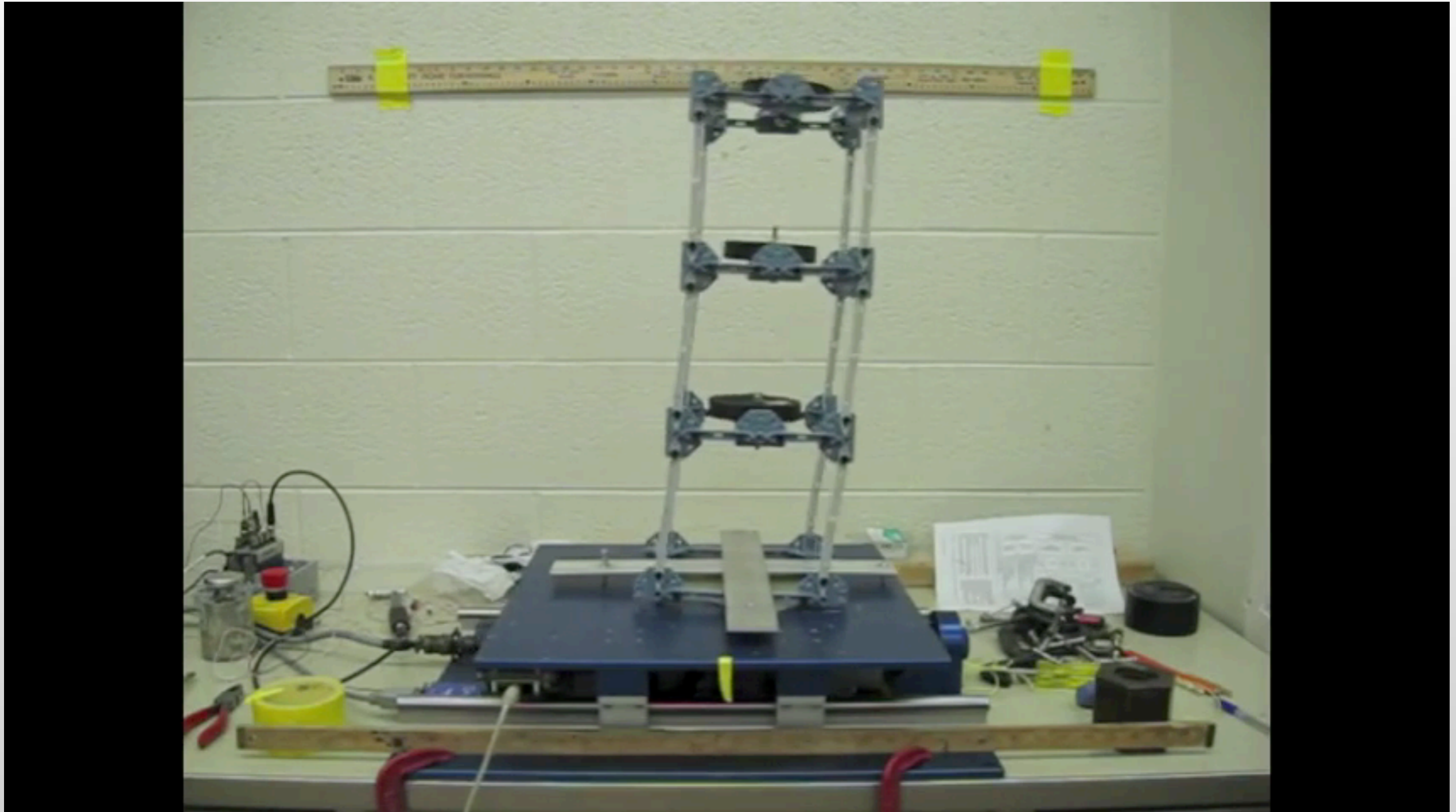


# Bridge Design





# Earthquakes



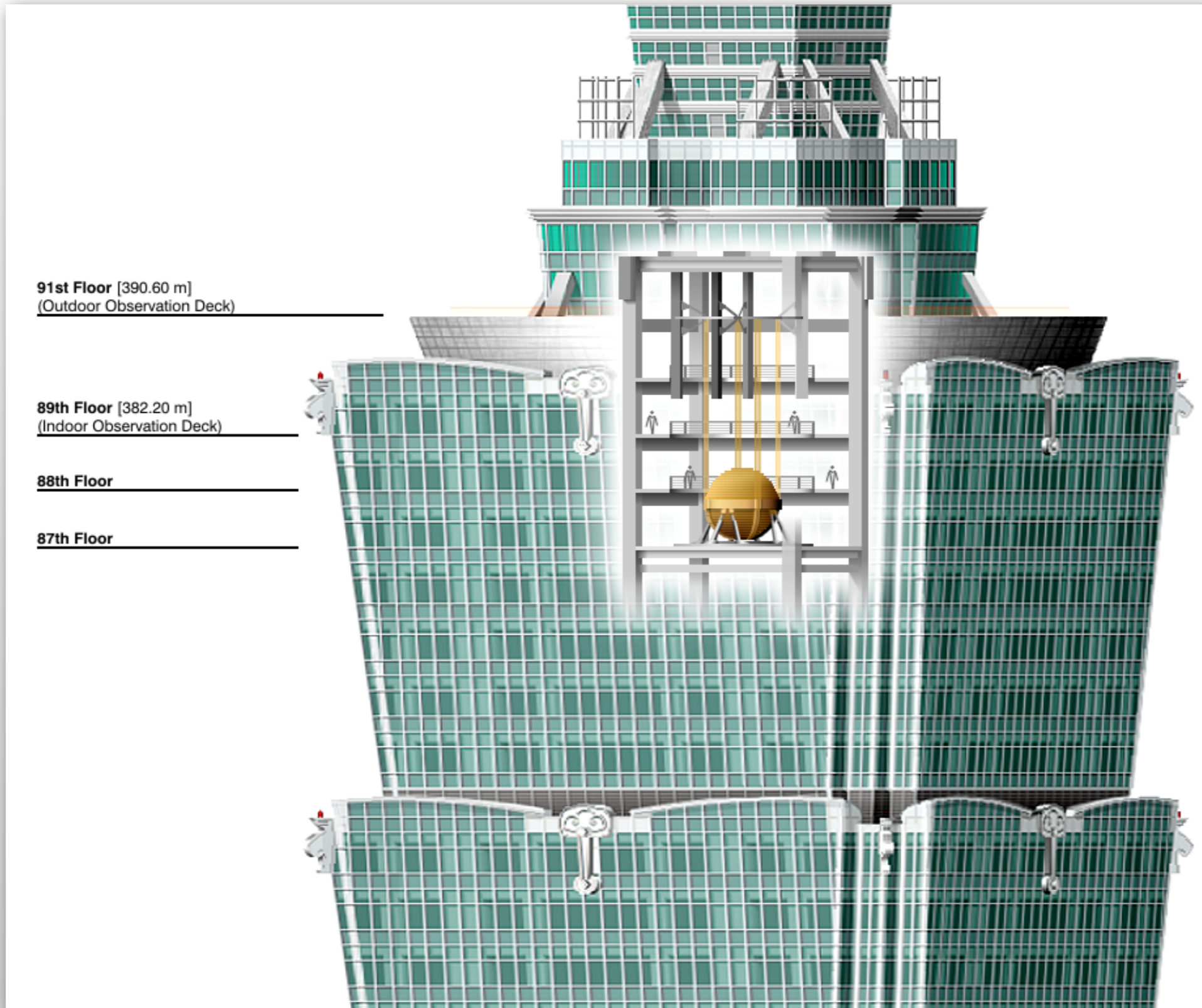


# Taipei 101





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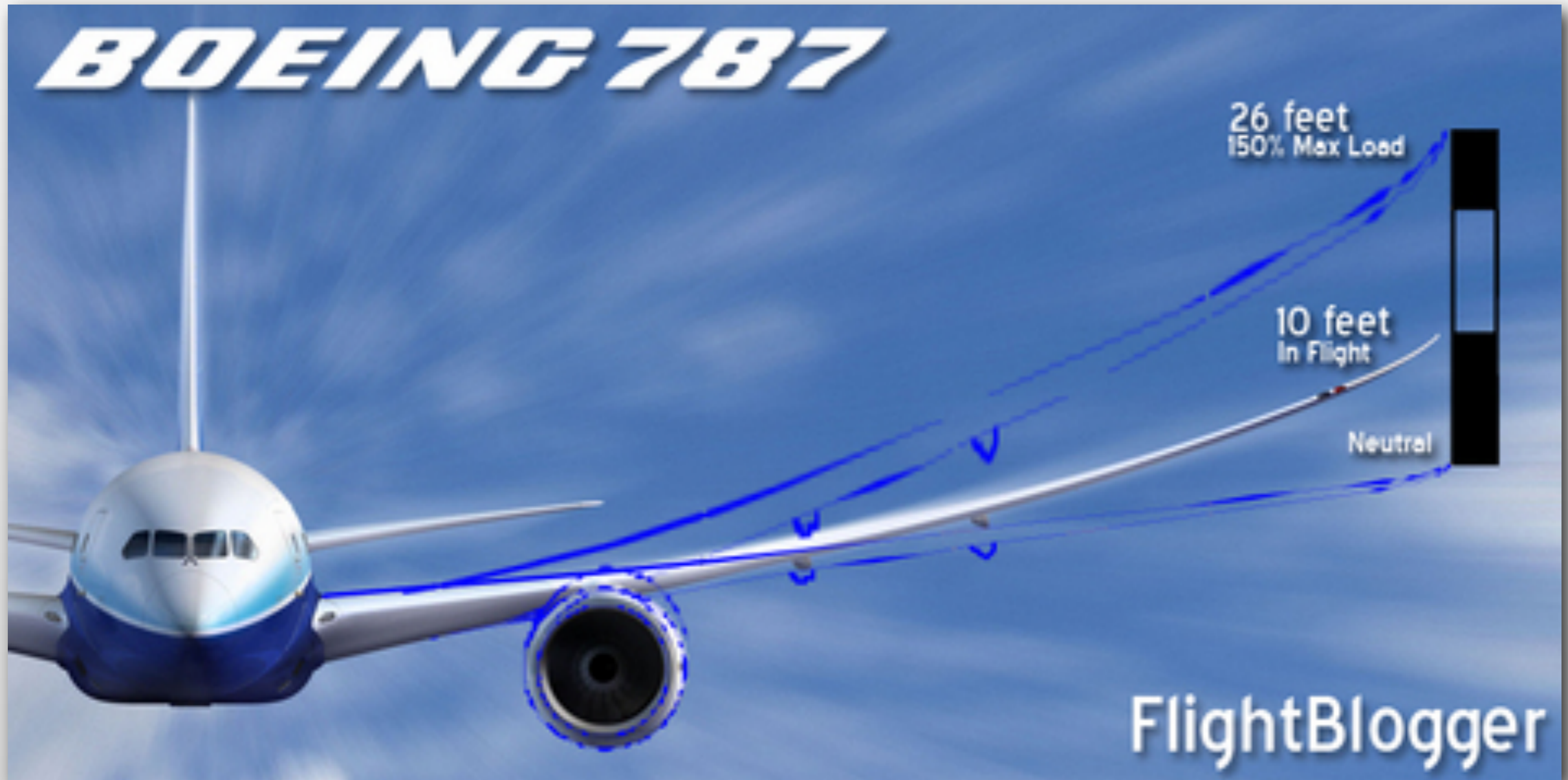


# (Modern) Wing Design – 787





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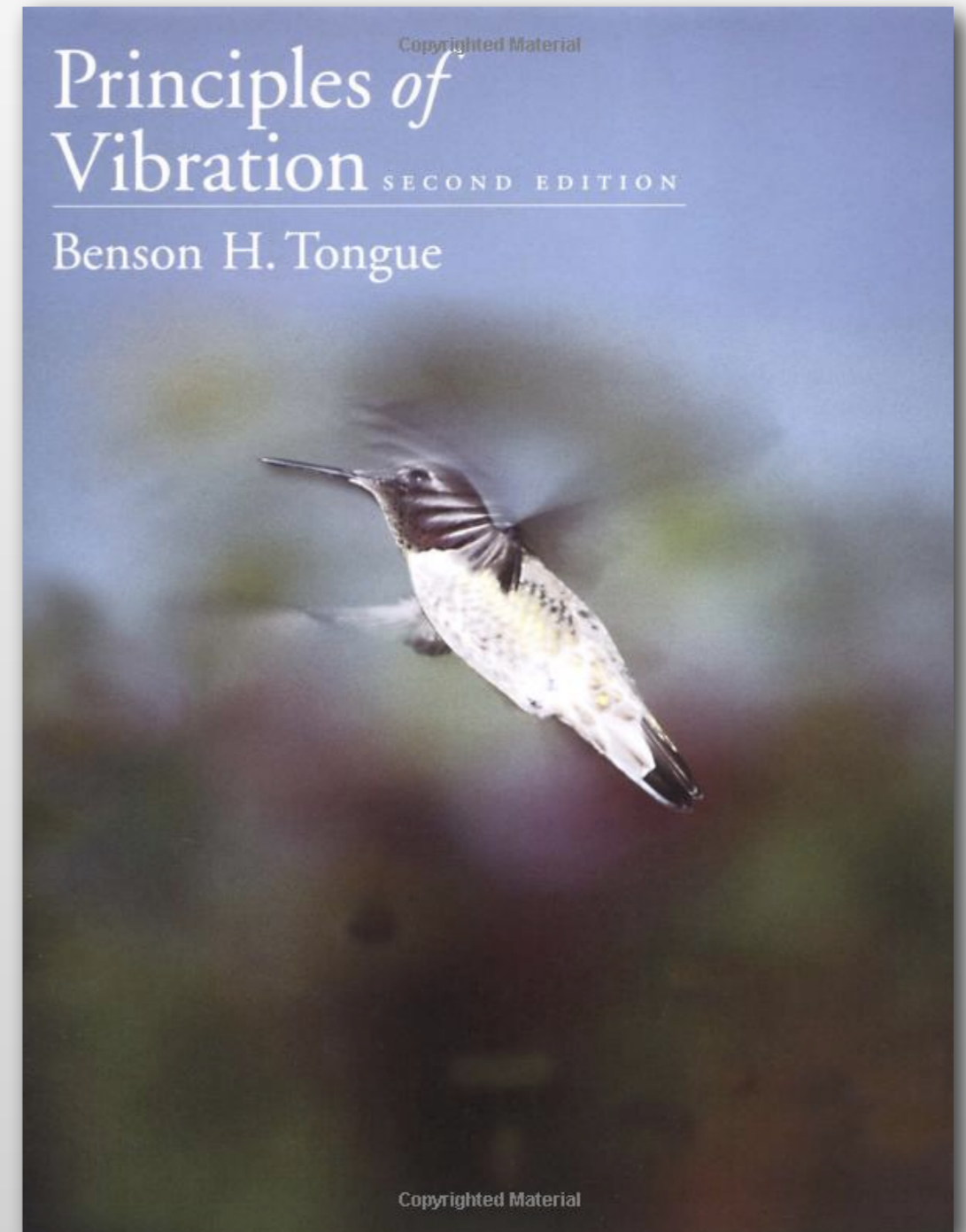




# Course Info (cont)



- TR 12:30 – 1:45pm, CLR 311
- Principles of Vibration, 2<sup>nd</sup> Ed.  
Benson H. Tongue
- <http://www.uclouisiaana.edu/~jev9637/MCHE485.html>
- No set office hours
- Prereq form is due as pdf via email by Friday, 1/25 at 5pm





# Course Tools/Resources



- Simulation using the scientific Python ecosystem
  - Anaconda Python distribution
  - NumPy, SciPy, SymPy, and matplotlib
  - Jupiter notebook – <http://jupyter.org>
  
- GitHub repository – <https://github.com/DocVaughan/MCHE485---Mechanical-Vibrations>



# Cranes in the *C.R.A.W.* LAB





# CDPM In the *C.R.A.W.LAB*





# My Contact Info



- Rougeou 225
- `joshua.vaughan@louisiana.edu`
- @Doc\_Vaughan
- `http://www.ucslouisiana.edu/~jev9637`



# Tentative Schedule



	Tuesday		Thursday	
<b>January</b>			17	Course Introduction Dynamics Review
	22	Chapter 1	24	Chapter 1
	29	Chapter 2	31	Chapter 2
<b>February</b>	5	Chapter 2	7	Chapter 2
	12	Chapter 2	14	Chapter 2
	19	Chapter 2	21	Chapter 2
	26	Chapter 2	28	<b>Mid-Term Exam 1</b>

*Note:* PDF version on the course site also has tentative assignment due date information.



# Tentative Schedule (Cont.)



	Tuesday		Thursday	
<b>March</b>	5	Mardi Gras	7	Chapter 2
	12	Chapter 2	14	Chapter 3
	19	Chapter 4	21	Chapter 4
	26	Chapter 4	28	Chapter 4
<b>April</b>	2	Chapter 4	4	<b>Mid-Term Exam 2</b>
	9	Chapter 4	11	Chapter 4
	16	Spring Break	18	Spring Break
	23	Chapter 4	25	Chapter 4
	30	Chapter 4		
<b>May</b>			2	Wrap Up
	7		9	

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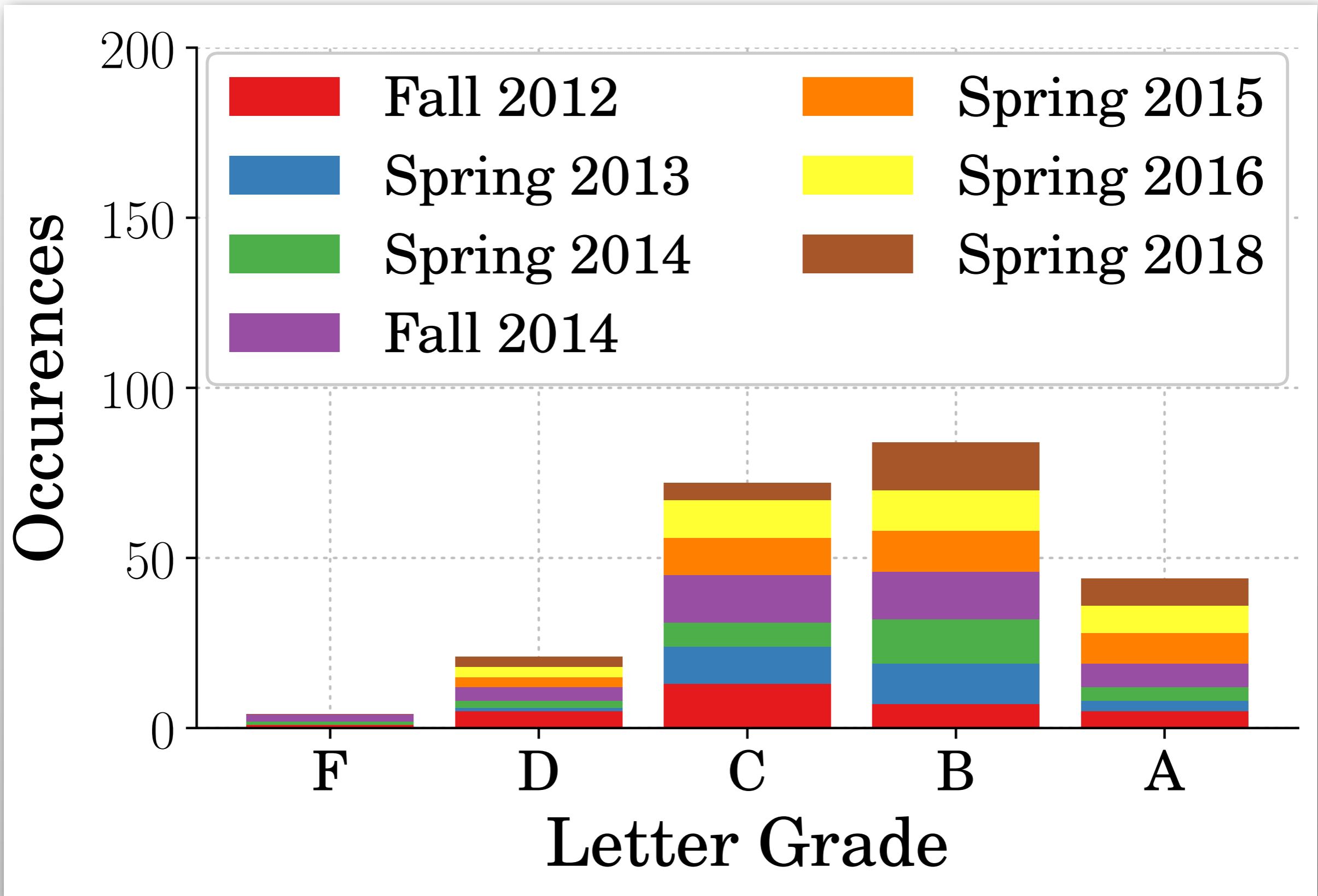
# Grading



- Homework – 10%
  - Due approximately bi-weekly
  - Electronic submission required
  - Will include some simulation/coding
  - For you!
- Mid-Term Exams – 40%
  - 2 exams, equally weighted
- Mini-Projects – 20%
- Final Exam – 30%

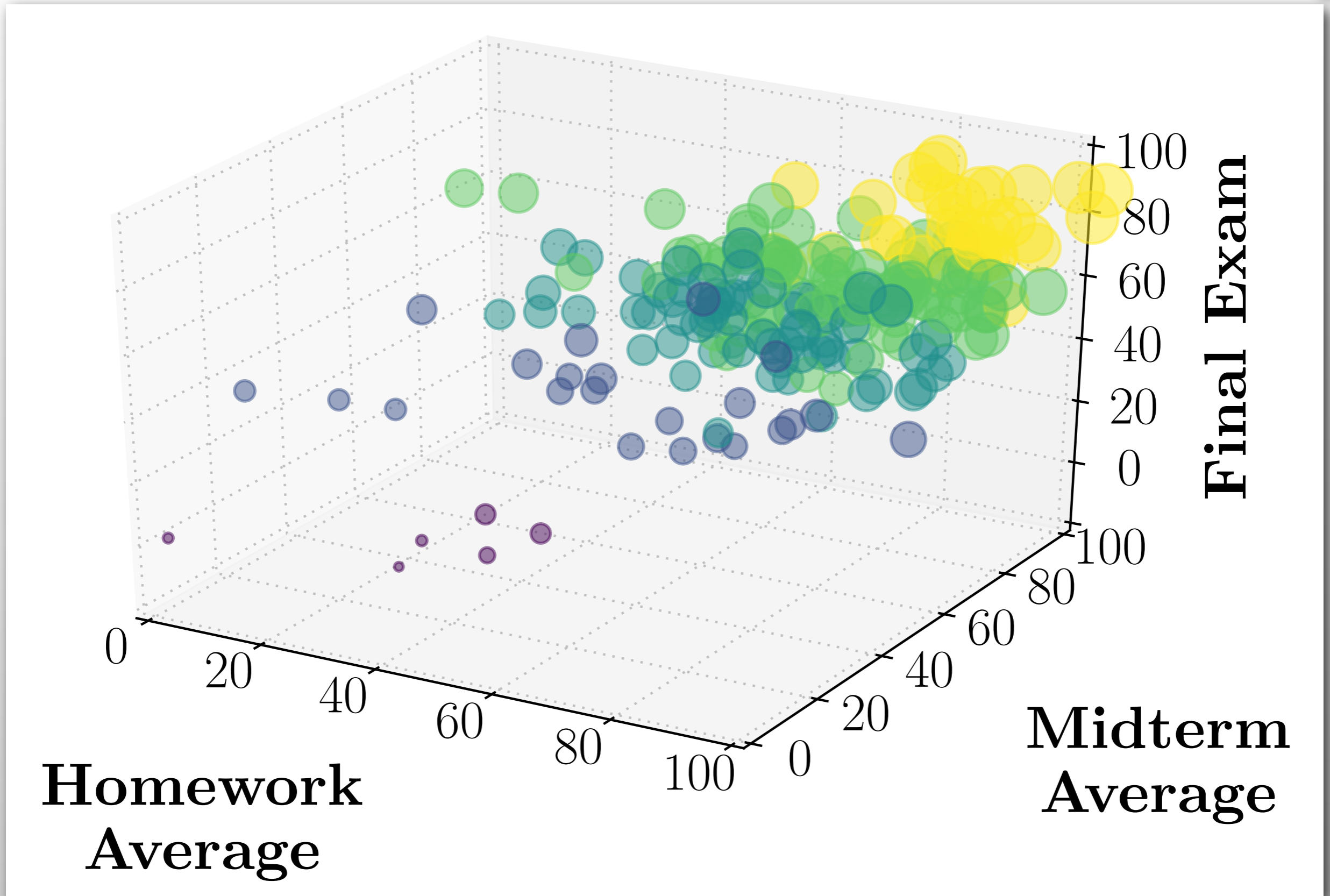


# Trends from Past Semesters





# Grade Analysis



# General Rules/Advice



- Be responsible for your own learning
  - If you have a question, ask
  - Try to understand, not memorize
- Be respectful of yourself and others – See the syllabus for the course Code of Conduct