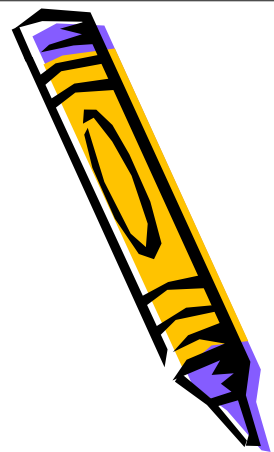




# ESE 112: Lab Goals and Overview



Instructor:

Joel Weingarten

[joeldw@seas.upenn.edu](mailto:joeldw@seas.upenn.edu)

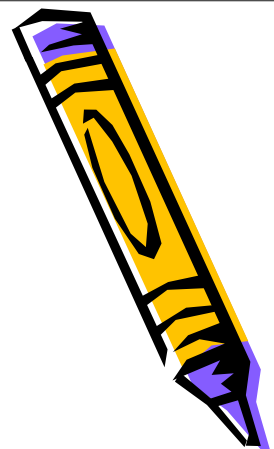
Office Hours

Thursday. 12-2(moore 205)





# Lab Logistics



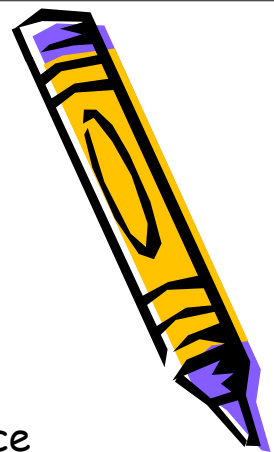
- TA's
  - Ross Kessler ([eros@seas.upenn.edu](mailto:eros@seas.upenn.edu)) (Wed. 6-8PM, Thursday 12-2PM)
  - Vadim Svirskiy ([svirskiy@seas.upenn.edu](mailto:svirskiy@seas.upenn.edu)) (Wed 2-4PM, Thurs 4-6PM)
- Collaboration Policy
  - Pre-lab and Lab Write-ups are to be done individually, you may use any external source (properly cited), with the exception of past years lab/students. Your answers must be your own, in your own words and be solely your own work.
  - Labs (with the exception of the first one) are to be done in groups of three or four. You are encouraged (required) to collaborate within your group and use any resources (books, course notes, etc) available to you. You however may not discuss the lab with other groups

Time Breakdown: 30 minutes lecture followed by 90 minute lab.





# Lab Logistics Cont.



- Groups
  - Throughout the semester you may choose your own groups
    - HOWEVER, you may not work with the same person twice throughout the semester
  - Post-lab exercises will ask what your and your group-mates contributions to the lab were
    - In extreme cases your grade will be adjusted based on your effort
  - If you feel for any reason you cannot reasonably work with one or more of your group-mates, see course instructor immediately.
    - You can be fired by your group...
- Missing Labs: Due to the nature of the course, making up missed labs is not possible. Unexcused absences will result in a 15% penalty for that lab.
- Grading (Lab is worth 60% of overall ESE112 grade)
  - Pre-lab exercises: 15%
  - Lab reports: 55%
  - Participation 5%
  - Final Exam 25%





# Lab Overview



- Integrates Math, Science, CS etc.
- Labs use **Edubot** to incorporate both ESE theory and programming skills
- Emphasis on critical thinking, problem solving and group work skills
- Working with cutting edge research platform on "real" research level problems
  - This means that the answers are not necessarily known
  - Don't expect to get the "right" answer

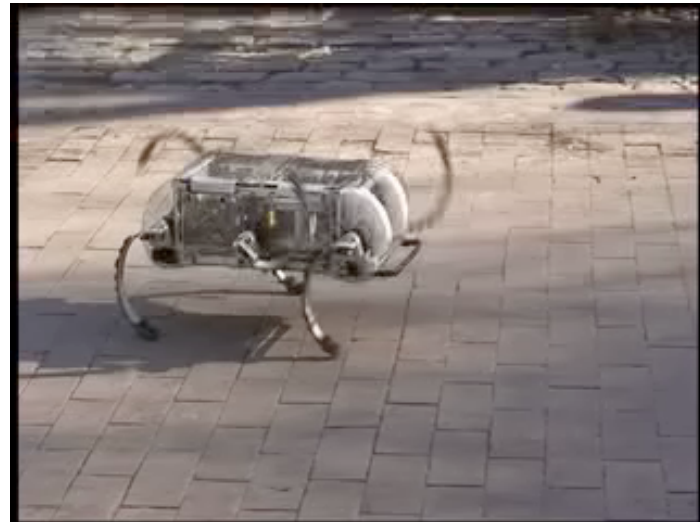




# Lab Overview

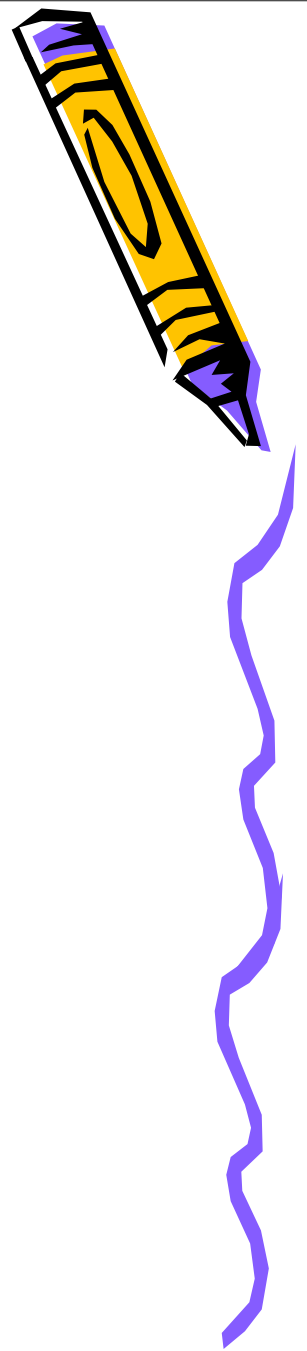


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# Lab Goals



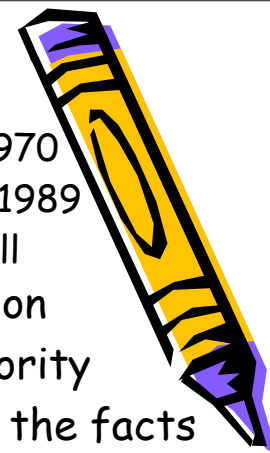
- Develop problem solving and critical thinking skills
- Increase interest in ESE
- Exposure to research level problems
- Apply programming and ESE theory to solve problems on a physical system





# Critical Thinking

Perry, 1970  
Nelson, 1989  
From Full  
Rely on  
authority  
Just the facts



Right or Wrong

Perceiving uncertainty as real



Personal Truth

If uncertainty, all  
answers fully valid

Opinion is insufficient



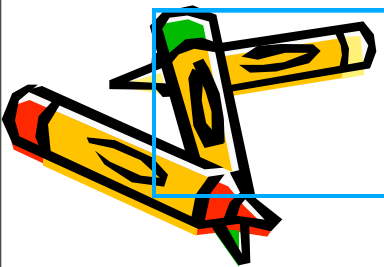
Evidence

Provide evidence  
to select among  
hypotheses but w/  
o evaluation

Attempt personal evaluation



Defense





# Critical Thinking

Perry, 1970  
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Evidence

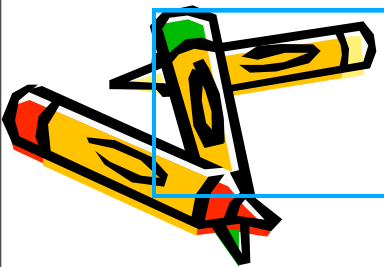
Provide evidence to select among hypotheses but w/o evaluation

Attempt personal evaluation



Defense

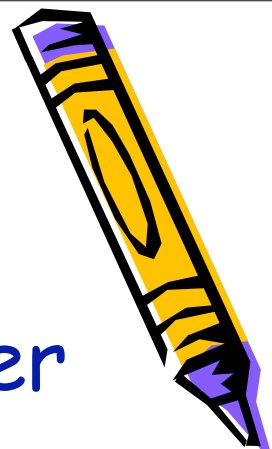
State alternatives  
Skeptical  
Accept responsibility



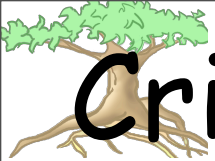


# Tools for Critical Thinking

1. Ask questions: be willing to wonder
2. Define the problem
3. Examine the evidence
4. Analyze assumption and biases
5. Avoid emotional reasoning
6. Don't over simplify
7. Consider other interpretations
8. Tolerate uncertainty



Wade and Travis From Full



# Critical Thinking and Problem Solving



1. Falsifiability - prove false
2. Logic - sound arguments
3. Comprehensiveness - exhaustive
4. Honesty - no self-deception
5. Replicability - must repeat
6. Sufficiency - extraordinary claims demand extraordinary evidence





# LAB RULES

1.) If your cell phone goes off.....

**I keep it 😊**



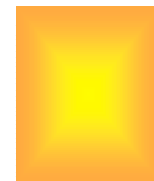
2.) If you bring food in the lab.....

**I eat it 😊 😊**



3.) If you touch the thermostat .....

**You Fail ☹**

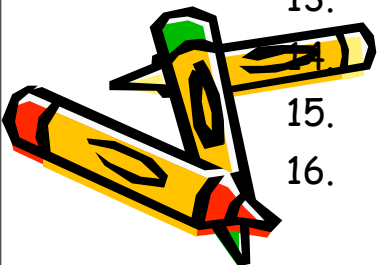




# Exercise 1: Learning Unix



1. Arrange yourself into groups of 3 alphabetically by first name, introducing yourself at every comparison.
2. Open a terminal
3. Start emacs and write a file called test.txt.
4. In that file include everyone in your groups name and answer the following questions:
  1. Why are legs important in robotics?
  2. What possible uses are there for legged robots?
  3. Why don't you have a humanoid robot cleaning your dorm yet?
5. Save the file
6. Create a directory called TEST
7. Copy the file into the directory
8. Delete the original copy
9. How big is the file?
10. Change directories to where the file is now located and rename in robotqsX.txt (where X is the initials of the names of the people in your group)
11. List the contents of that directory
12. Go back to the original directory
13. Search for the file robotqsX.txt
14. Logout
15. Log back in as "ese112" with password "??"
16. Email the robotqsX.txt file to me (joeldw@seas.upenn.edu)





# RHEX Demo

Grab your stuff we're taking the robot  
for a walk!

