

# Lecture 1.1 – Intro to the Course

## Specific Learning Objectives:

**None**

## **Agenda for today:**

- 1. A little about me**
- 2. Go over syllabus**
- 3. Why learn R?**
- 4. Learn to train a dog**
- 5. Install R and RStudio**

# **Student Office Hours**

**Instructor: Lindsay Waldrop, Ph.D.**

**Grader: Eli Karmon**

**Wed 10 – 11 am**

**Thur 2 – 4 pm**

**by appointment**

## **What are office hours and why should you come?**

- Office hours are for students! You are not bothering or interrupting us, this is time we set aside every week for my students!
- They are a great place to get clarification on content, ask questions, listen to other students ask questions, practice work, etc.
- They are also a great space for mentorship: career advice, info on graduate schools, exploring things that interest you, connecting with research, etc!

# Course Navigation

## - ***Where do I find course information?***

Github repository: <https://github.com/CPSC-292/Fall2024-CourseInfo>

- syllabus
- course schedule
- course learning objectives
- course assignments
- lecture notes
- sample code

## - ***Where do I find and turn in assignments and see my grades?***

Course Canvas sites:

MWF 11 - 12 (Section 01): <https://canvas.chapman.edu/courses/65998>

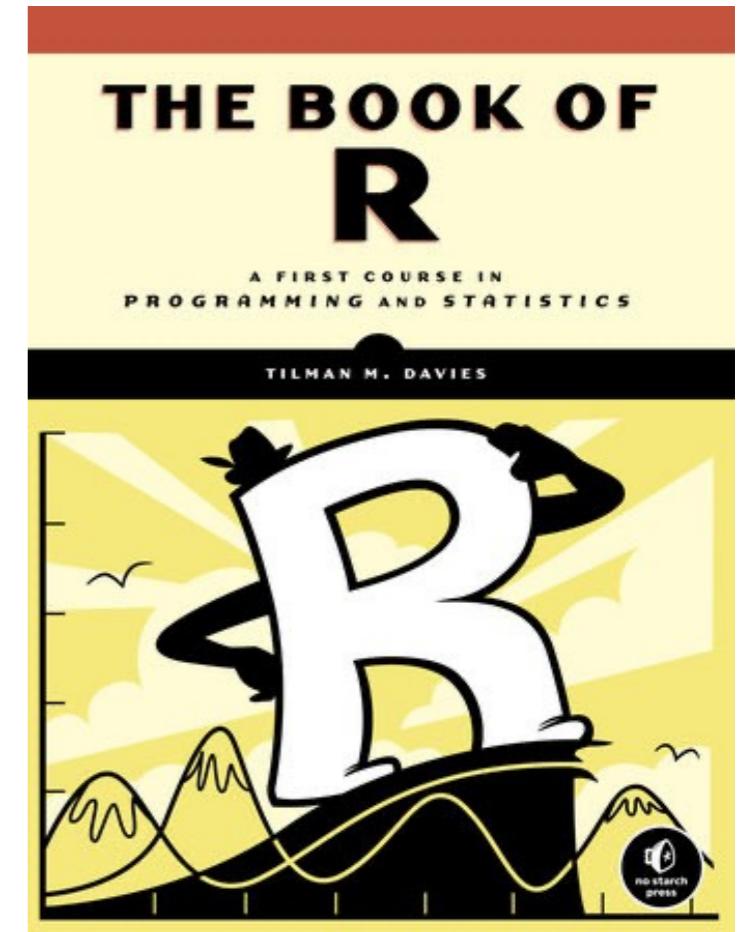
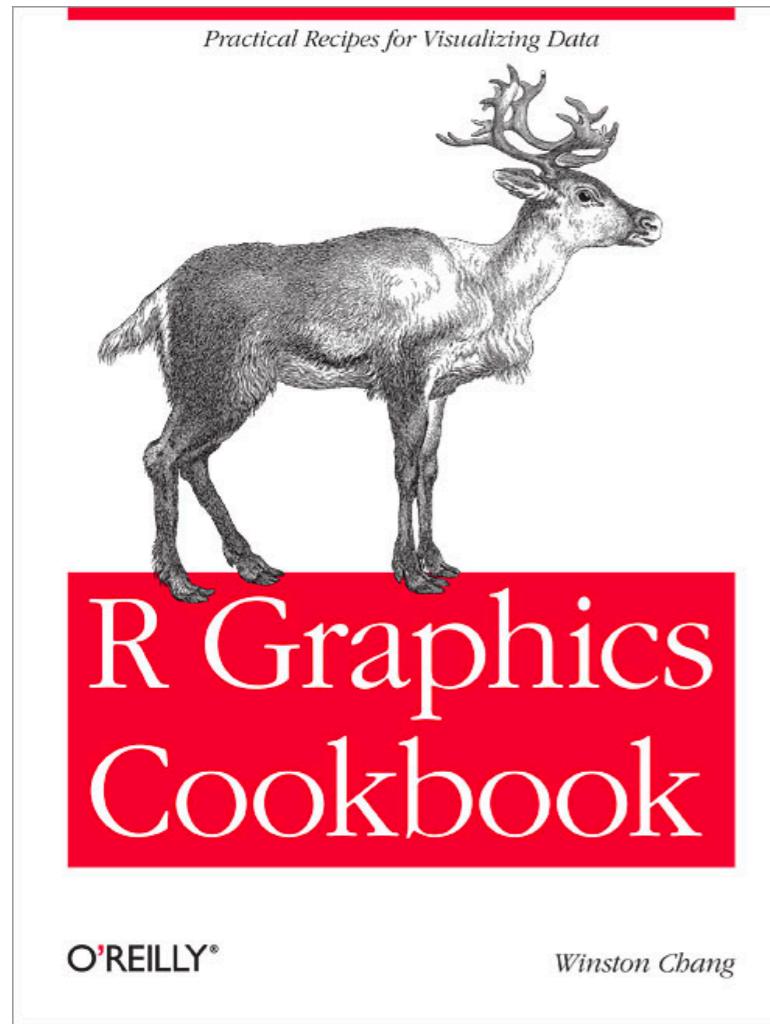
MWF 12 - 1 (Section 02): <https://canvas.chapman.edu/courses/66010>

## - ***What is the best way to communicate?***

Slack Channel! Link in Canvas Module!

# Course Materials

- **Required Text:** *The Book of R* by Tilman Davies.  
First Edition, No Starch Press. ISBN-13: 978-1-59327-651-5.  
Link to publisher website: <https://nostarch.com/bookofr>



- **Suggested Text:** *R Graphics Cookbook* by Winston Chang.  
First Edition, O'Reilly Media. ISBN 9781491978603.  
Online at: <https://r-graphics.org/>

# How this course works

- This is a **labor-based** and **mastery-based** course.
- Your grade in this course will be determined by:
  1. Your labor and participation.
  2. Completion of work will indicate level of mastery of course material.

# Grading System (Labor)

- All work is assessed on a three-tiered scale:
  - **Completed and Satisfactory** (score of 1)
  - **Completed and Unsatisfactory** (score of 0) - you will receive feedback and have another opportunity to achieve satisfactory level.
  - **Not Completed** (score of 0) - no late work will be accepted.
- **Life Happens Clause:** request a new deadline for any assignment within 48 hours of the deadline. Request via Slack to *your* instructor. ***Be sure to include the new deadline you are requesting.***

# Grading System (Labor)

- **Rescoring work:** You are allowed 4 attempts for each work item (except Projects).
  - Each attempt must be made within 3 business days of receiving feedback from the instructor.
  - **It is critical that you keep up-to-date with material** (especially in Unit 1).
- **Assignments are complete only after lecture videos are viewed!**
- **Participation is required at all levels.** Non-participation is marked only. Reasons: absence, excessive lateness (>10 mins), off task, distraction, etc.

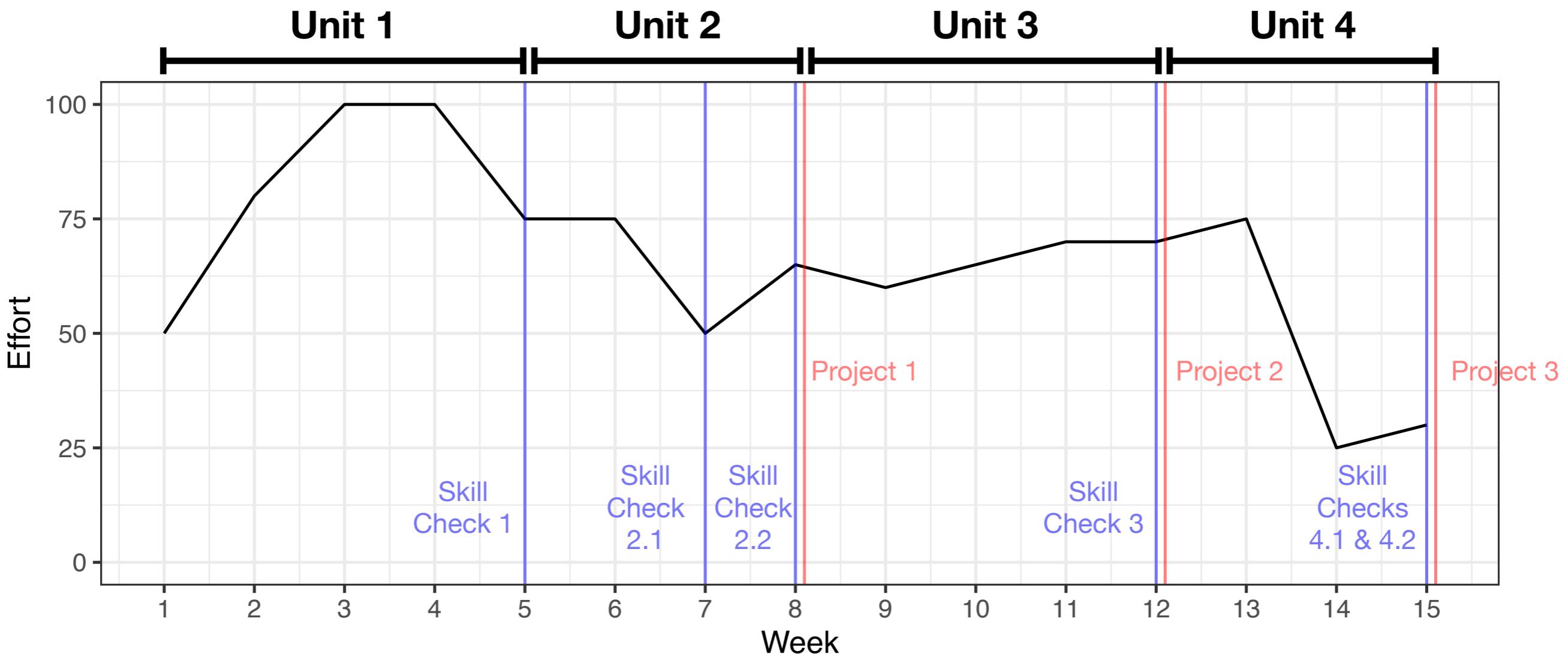
# Grading System (Mastery)

- Work is designed to demonstrate levels of mastery in the material.
  - **Assignments (C-level):** Designed to assess *basic competence* of learning objectives covered. Flexible number.
  - **Skill Checks (B-level):** Designed to assess *advanced competence* of learning objectives covered. Usually involve synthesis of concepts and more independence than assignments. 6 in total.
  - **Projects (A-level):** Designed to assess *mastery* of learning objectives covered. Work will involve synthesis, creativity, independence, and originality. 3 in total.

# Grading System (Mastery)

Final Course Grade	Projects completed (A-level)	Skill Checks completed (B-level)	Assignments completed (C-level)
A	3	6	100 %
B	1	6	100 %
C	0	2	100 %
D or F	0	< 2	< 90 %

# A Word about the Amount of Work...



- This course's effort is front-loaded.
- Unit 1 moves quickly, contains half of all course assignments!
- **Critically important to keep up with assignments in Unit 1.**

# Other Course Policies

- Masks are not required, but please be respectful of others' choices.
- Come prepared to learn and participate!
- Final project policy: you **MUST** participate in the final project.
- Group work is encouraged unless the assignment is an *individual evaluation*.
- Communication: Please Slack instead of email. Expect replies between 9 am and 5 pm during the regular work week.
- Generative AI Use policy is in the syllabus.

# What if you need help?

- ***Please contact me!*** I want to help, whether it is situational, financial, or academic. I am prepared to be very flexible, including issuing course incompletes (which can be finished later).
- The Dean of Students can help connect you with services, no matter what type of problem you have!
- If you are struggling mentally, please talk to me or seek help through Student Psychological Counseling Services:  
[https://www.chapman.edu/students/health-and-safety/  
psychological-counseling/](https://www.chapman.edu/students/health-and-safety/psychological-counseling/)

# Course Learning Objectives

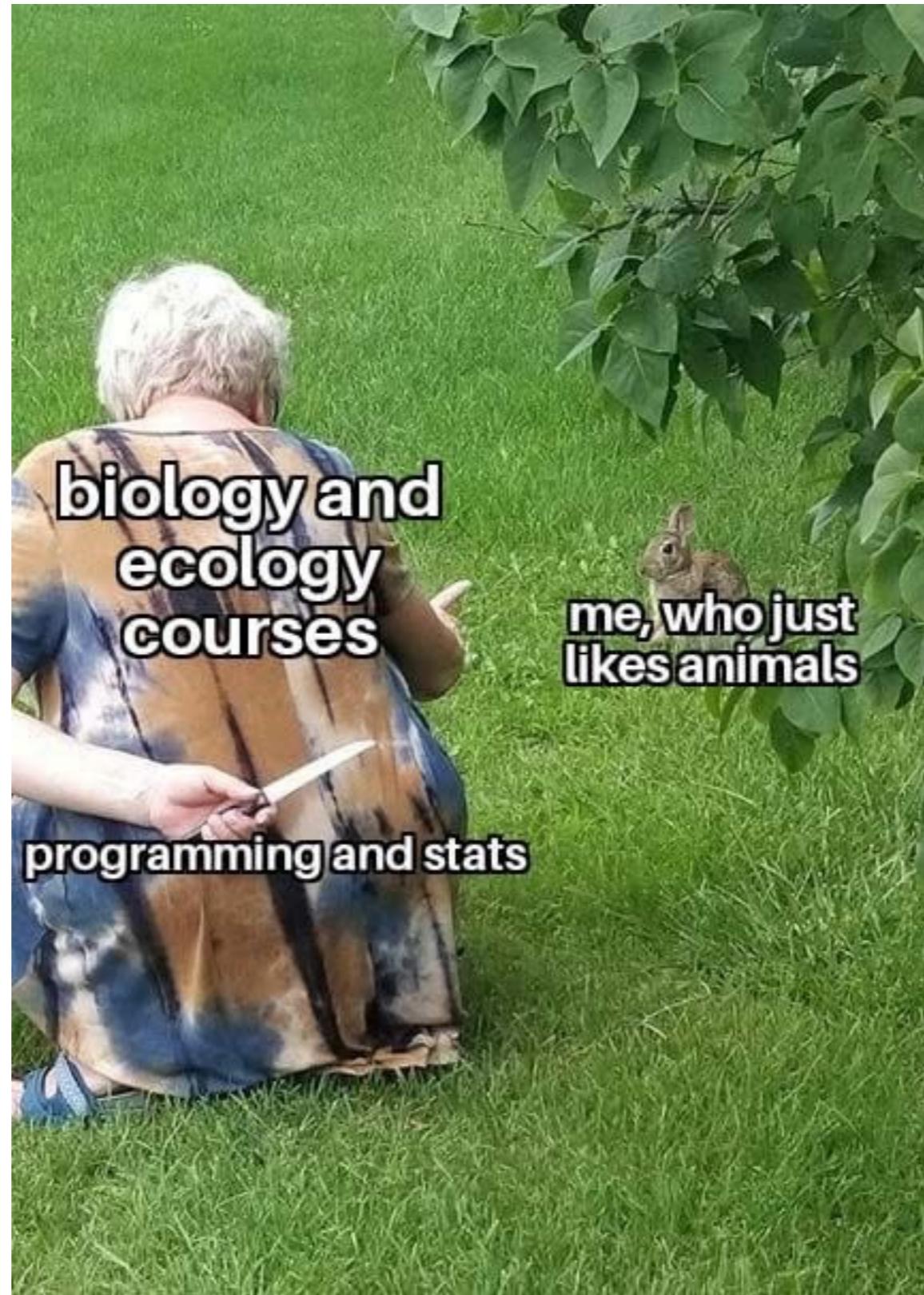


## Main Learning Objectives:

1. Understand the basic structure and function of the *R* programming language.
2. Create visualizations and data analyses in the *R* programming language.
3. Independently perform basic data analysis and visualizations in a way that communicates ideas clearly.

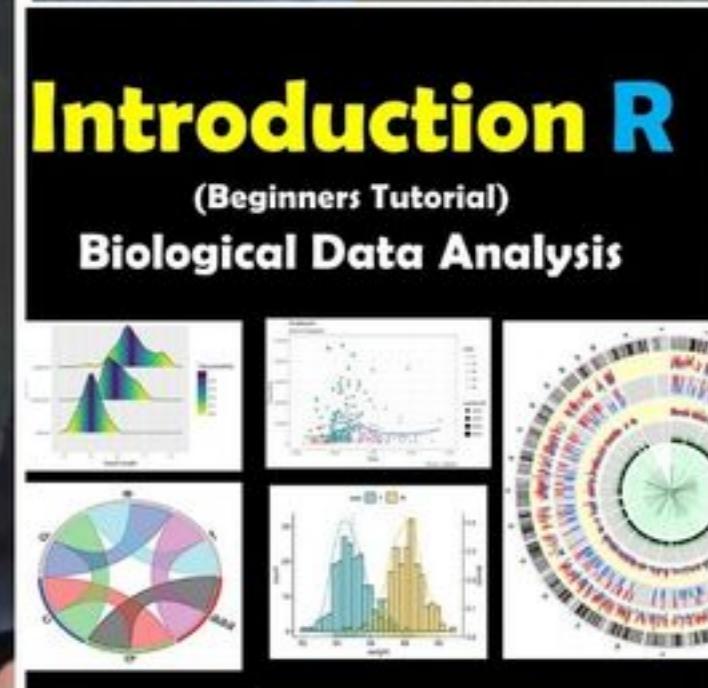
Detailed learning objectives (and how they are assessed) are in the file CLO.pdf!

**It's true. Sorry :(**



# Why Learn *R*?

- Biology today involves lots and lots and lots of data!
- Most disciplines require skill in handling and analyzing data.
- *R* is a high-level yet powerful programming language that can assist with statistics, analysis, and visualization.
- *R* is free and open-source, making analyses replicable.
- *R* is flexible and has a huge community working on new stuff!

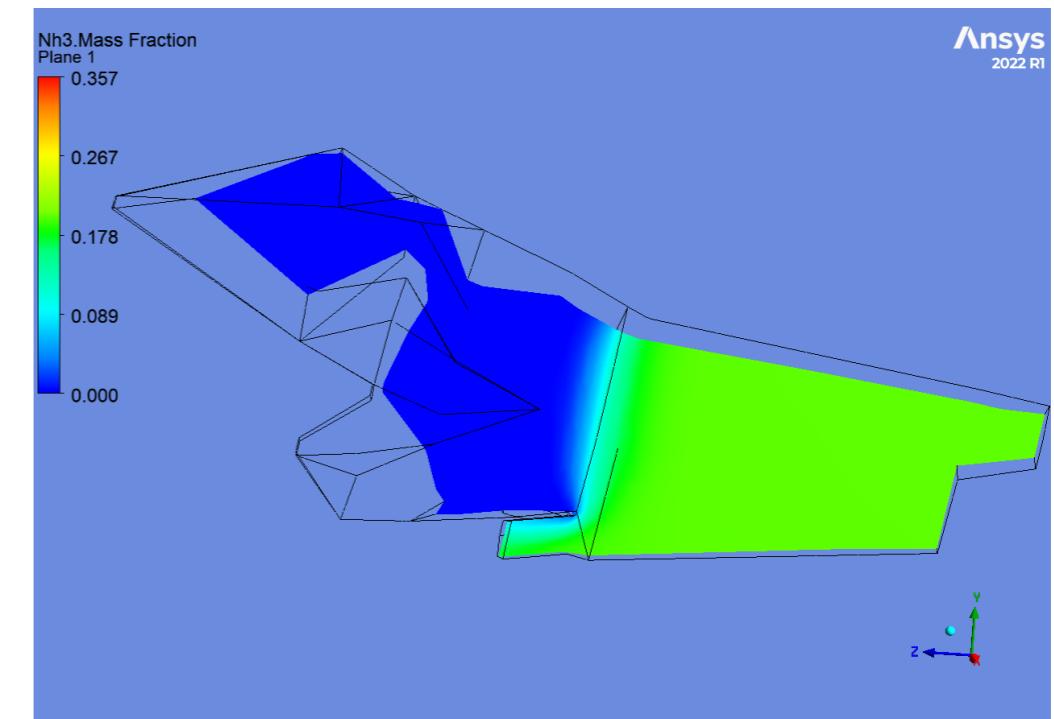


# About me

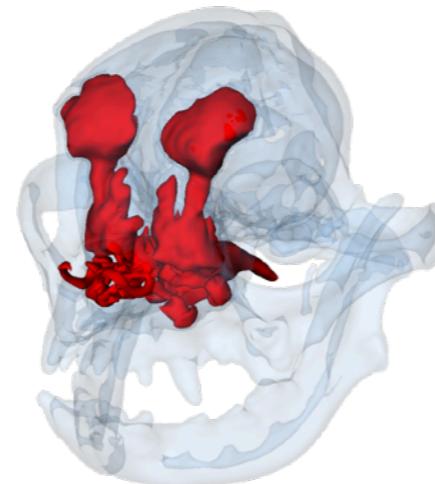
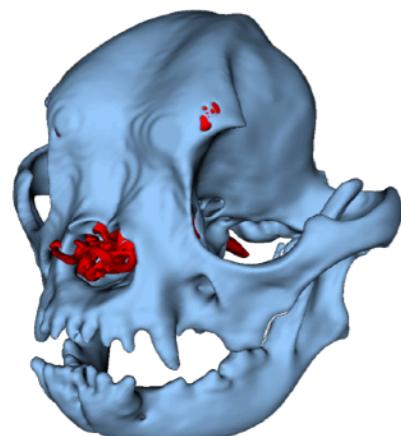
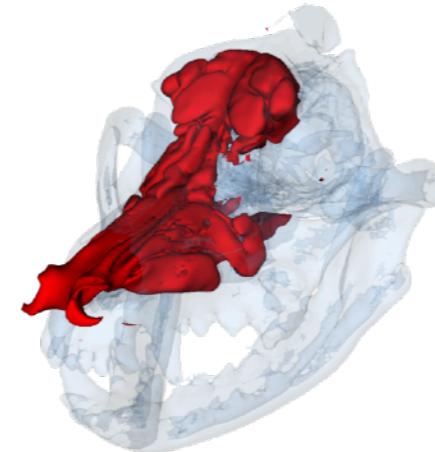
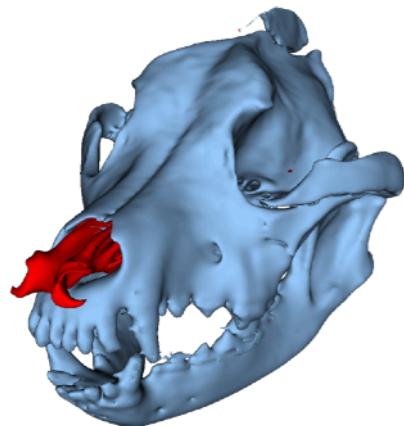
Lindsay Waldrop, Ph.D. (Biological Sciences) <http://waldroplab.com>

## Exploring the evolution of biological fluid-structure interactions

### Computational fluid dynamics



### Morphometrics



### Experimental fluid dynamics



# How do you train a dog to find bombs (or whatever)?



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# **How do you train a dog to find bombs (or whatever)?**

**You split the behavior into little, tiny pieces and teach them a bit at a time!**

## **1. Imprinting**

**“This smell means: FREEZE  
and then fun!”**

## **2. Discrimination**

**“This smell not that one.”**

## **3. Generalizing**

**“Gotta keep getting closer to The Smell no matter what.”**

# Imprinting

This step teaches the dog that the game means if you smell this special odor, you **FREEZE** and then get a treat or toy.

**IT MUST BE EASY AND FUN!**

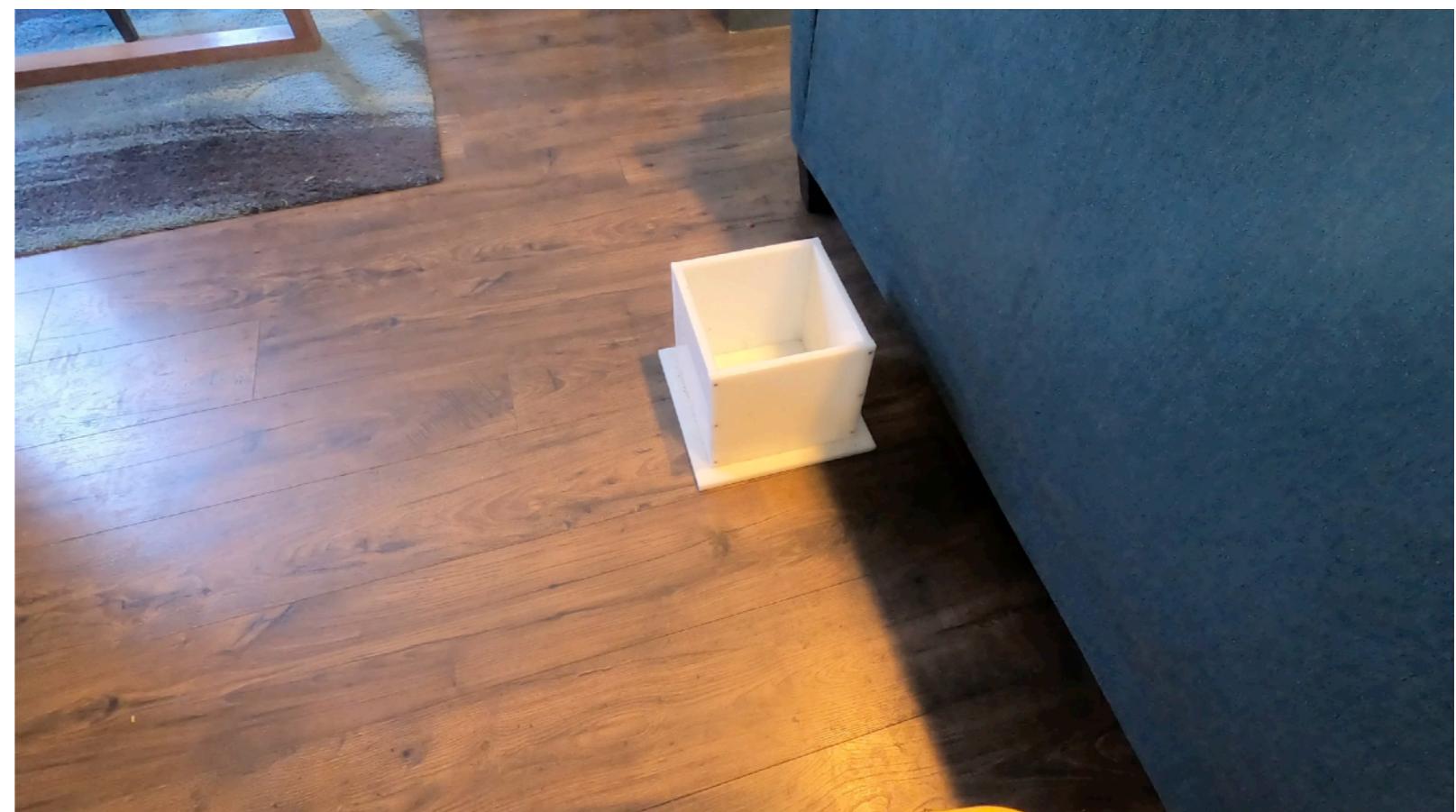
**Takeaways:**

**Short sessions**

**Easy, quick success**

**Lots of feedback**

**Individuals work at different paces**



# Discrimination

This step teaches the dog that the game means the target smell, not any other smell.

Errors are REQUIRED for this step!



Takeaways:

Make things harder a little bit at a time

Try stuff - it doesn't matter if it's wrong

Individuals work at different paces



# Generalization

This step teaches the dog that the game is the same regardless of the environment.

It takes the longest and is the most difficult!

Takeaways:

Try skills in different situations to learn

It's ok to get a little overwhelmed, just keep at it

It's ok to struggle and look for support

It's ok to end a little early



**Here's where we're at ...**

**... progress, not perfection**



**Don't skip the simple stuff!**

**Take it at your own pace!**

**It's ok to struggle and look for support!**

# Downloading R and RStudio



**Download R:**  
<https://www.r-project.org/>



**Download RStudio:**  
<https://rstudio.com/products/rstudio/download/>

- 1. Go to <https://cloud.r-project.org/>**
- 2. Select your operating system.**
- 3. Select the latest release that is “notarized and signed.”**
- 4. Save and open the file, follow the instructions to install.**

- 1. Select the RStudio Desktop version.**
- 2. Download, open, and follow instructions to install.**
- 3. Open RStudio to get started!**

**NOTE: be sure to select the correct chip type for Macs!**

# Action Items

- 1. Have R and RStudio installed on your personal computer by Wed 8/30!**
  
- 2. If you are having trouble with a laptop, please get help ASAP!**