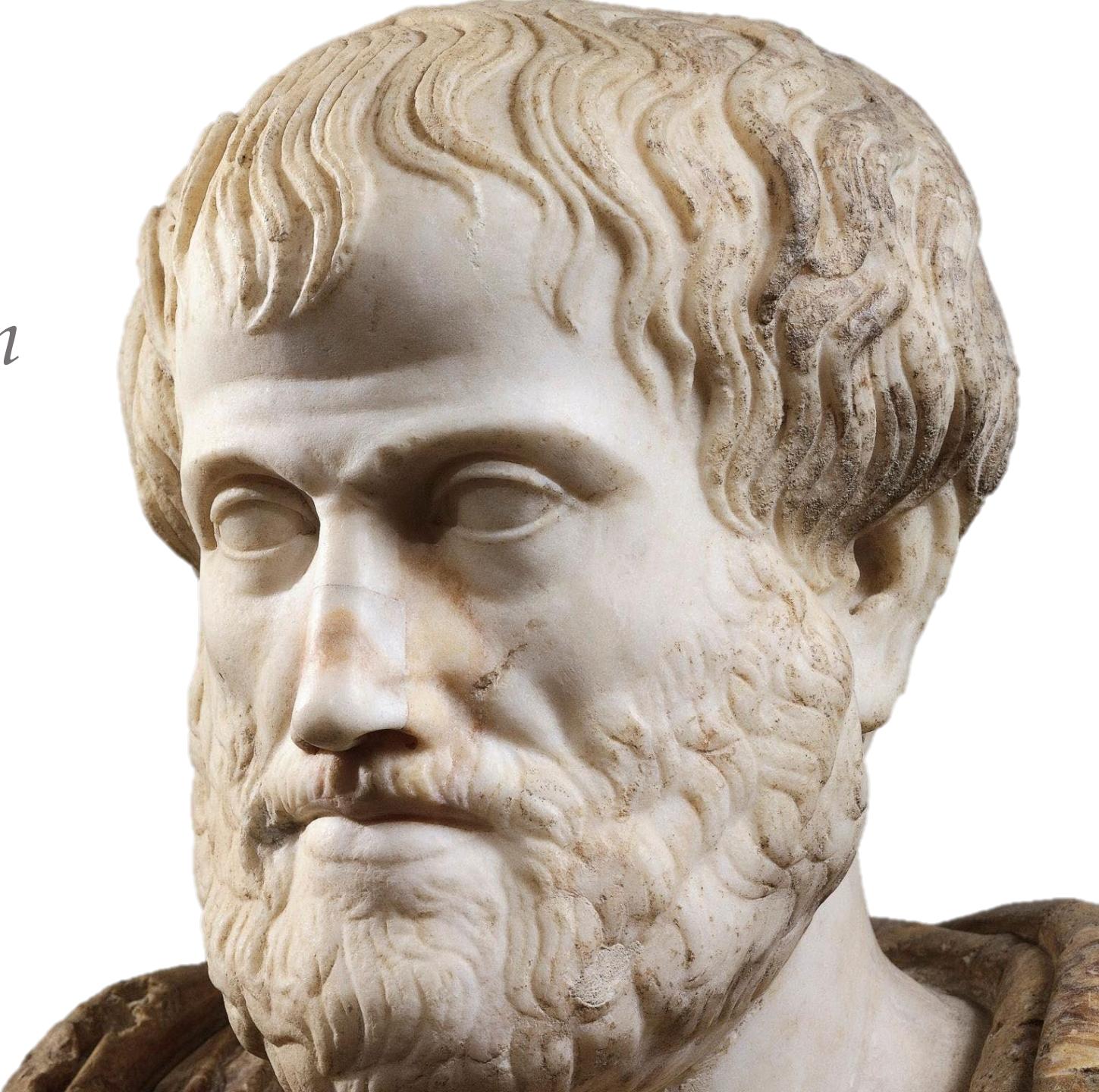


*The roots of education  
are bitter,  
but the fruit  
is sweet*



Aristotle, 384 – 322 BC



combra.cs.rutgers.edu

a roadmap to success in...

206

# Discrete Structures II

Konstantinos P. Michmizos

Computational Brain Lab

Computer Science | Rutgers University | NJ, USA



# What is success?

*a roadmap to success in...*

Getting an A?



Getting an A without trying too much?

WHAT PART OF  
**NO**  
DON'T YOU UNDERSTAND?

Getting an A by cheating?



# Last time ... (from teaching evaluations)

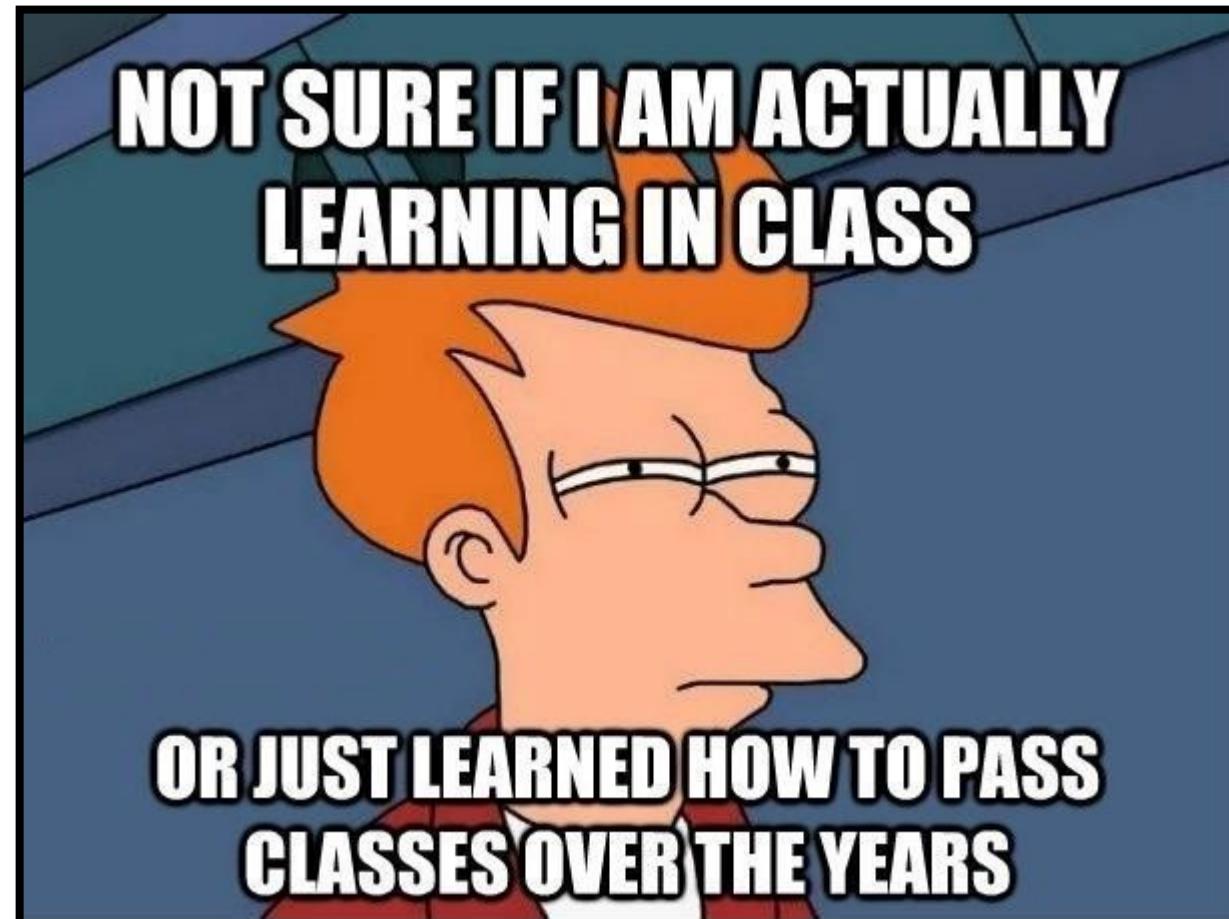
- He provided valuable **insights in the long–terms goals** and benefits of learning, rather than only having interest in one's grade.
- The content was very interesting and made me **change how I think about solving problems**. I enjoyed this course a lot.
- He's made me realized that **being challenged isn't a bad thing**
- The course has really got me interested in logic and probability type of mathematics. Previously, I disliked probability because I had a difficult time wrapping my head around it all. Sometimes I would even use probability functions and math to do certain tasks without knowing what was actually happening. **Now I can say I'm knowledgeable and understanding of the course material taught by the instructor**.
- He encouraged us to focus **more on learning and less on the grades**.
- He wants us to **learn rather than worry about grade**. He is very helpful be it with questions, extra credit to boost our grade or with assignments. He has replied to all my emails even if it was very late at night. He is literally the best professor I have ever had. He takes students failure as his own failure.
- He has a lot of passion for teaching and for helping students and really made me **want to learn**
- Best professor I ever have so far here at Rutgers, nothing is better than this **beast**. Students are grateful!

# By the end of this lecture...

a. You will know what to do

b. You will know what not to do

- If you do **a** and **b**, **you will get an A**
  - Trust me:
    - Fall 2019: 60% of the class got an A
    - Spring 2021: 70% of the class got an A
    - Fall 2021: 70% of the class got an A
    - Fall 2022: 70% of the class got an A
    - Fall 2023: **75%** of the class got an A
      - **5/170 failed the class**
        - despite me chasing them...
- The rest ~ 30% did not trust me (and themselves) enough to do **a** and **b**



1 instructor (lectures)

3 TA's (in-person recitations)

1 Grader (quizzes/midterms/final)



# Instructor

**Konstantinos Michmizos**

[michmizos@cs.rutgers.edu](mailto:michmizos@cs.rutgers.edu)

Research Interests:

- *Less Artificial Intelligence*
  - Neuromorphic Computing
  - Neuro-Robotics

**Office Hours**

**Mondays 13.00-14.00**

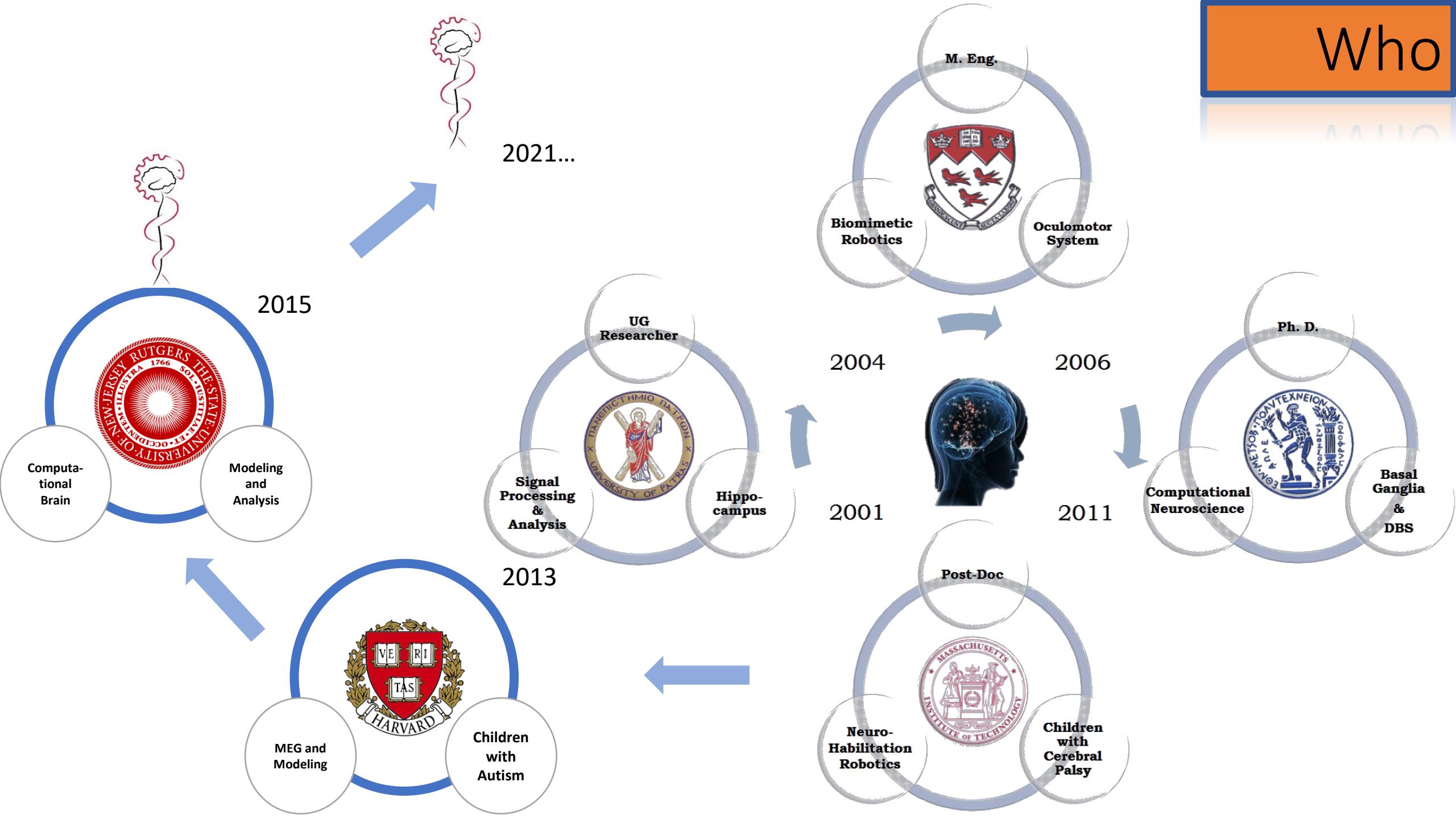
**Email me first**

to ask for a specific time slot  
and for a specific issue



Who

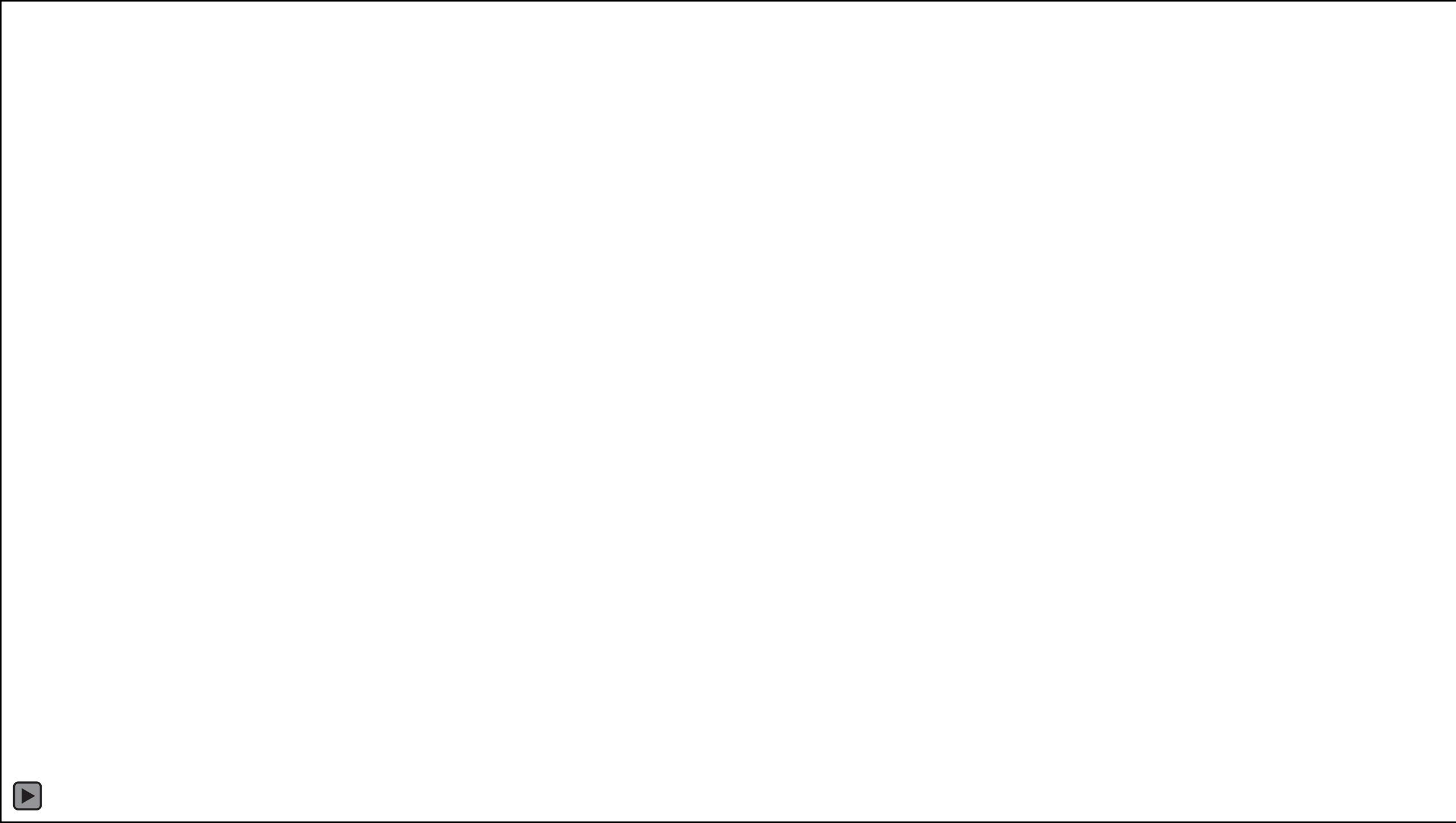
# Who



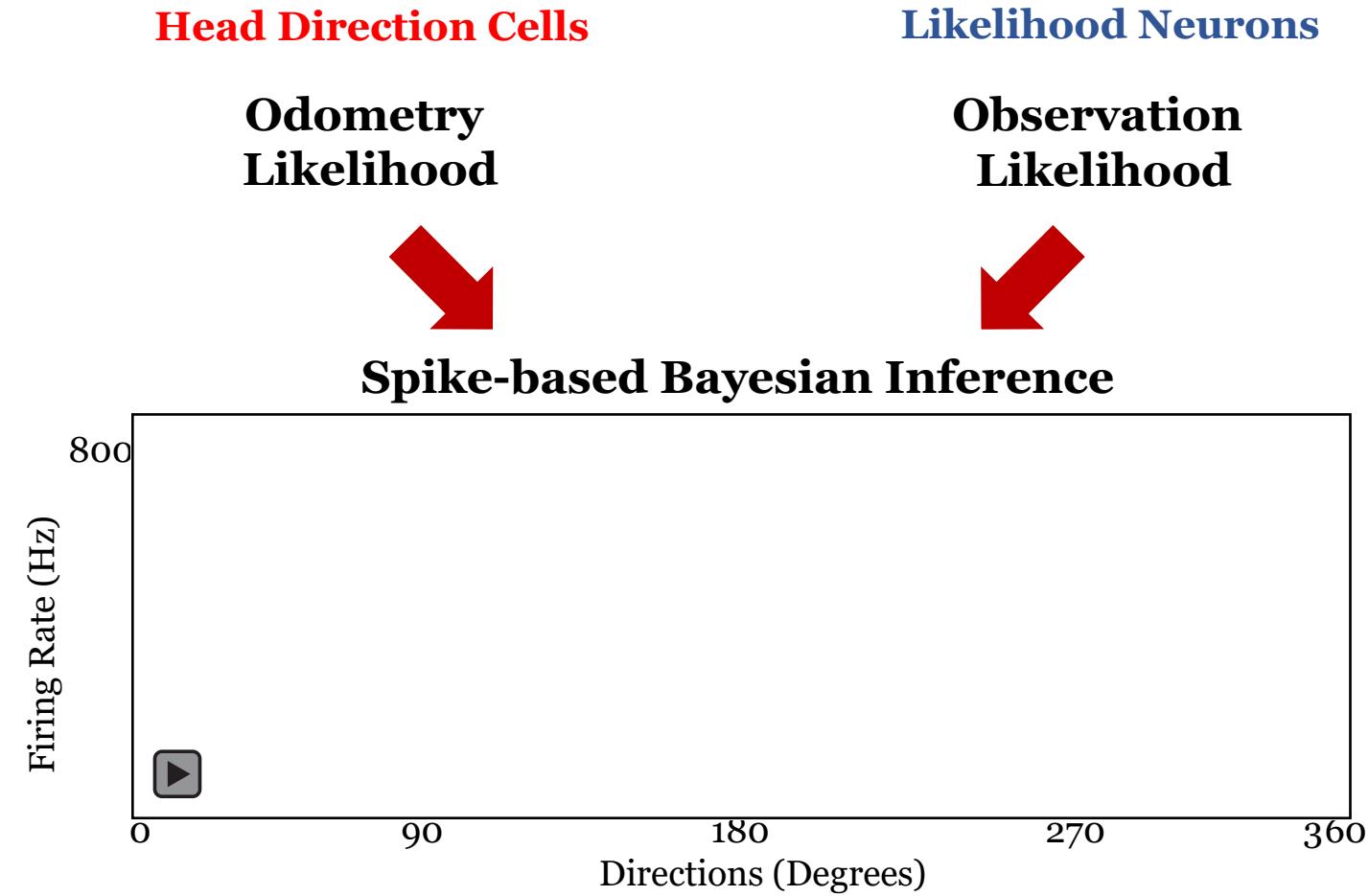


Is this science  
fiction?





# Bayesian Inference Network on Loihi



**Jack Klawitter, PhDc**

TAs

Section: 1

Who

Recitation: Wednesday 7:45PM - 8:40PM @ COR-101

**Recitations**

**Stefan Obradovic, PhDc**

- Section: 2

**start**

Recitation: Wednesday 4:05PM - 5:00PM @ SEC-207

**next week**

**Atin Srivastava, MSc**

- Section: 3

Recitation: Monday 4:05PM - 5:00PM @ SEC-207

# The challenges this year



*~160 students (Sections 1, 2, 3)*



Would you fly this airline?

1. canvas – set up your notifications **now** to receive announcements in real-time
2. This class has ~160 students. That means that we will be handling ~160 individual cases. The only effective way that our civilization has ever found to structure so many people competing for a finite resource, so that everything is fair for everyone, is: **rules**.
3. So that we have enough resources to help all students, if you do not follow the rules, you will most probably not get what you want (especially when your question shows lack of effort – e.g., “What is my TA’s email?” or... “Who is my TA?”)

# Course Info

- Canvas
  - Homework, lecture slides, announcements, grades
  - Everything that is posted on canvas is considered “known”
    - *So please do not ask me for a TA’s email/office hours/favorite color etc.*
- Discussion @ Canvas
  - Forum for asking/answering technical questions related to material
  - Will be constantly monitored by Instructor/TAs

# Who/How should I contact for my issue?

**[a]** If you have a question on one of the problems, use the forum. **Do not** email your TA. **Do not** email the instructor.

- It is much more effective when a) you communicate your question that quite probably others have, or will have when they reach your point of understanding.; and b) we monitor, endorse, or enhance your own answers where everyone can see them.

**[b]** If you have an admin issue or anything unrelated to Q&A for the course material, you should first contact your TA. E.g., If it is a grading issue, the TA will contact your grader.

- Only if the issue is not resolved upon discussing with TA, you should email me. Please forward the email communication to me.

**[c] Keep your communication brief to everyone**

**[d] In all your communications, use [CS206] as part of your subject - Otherwise, your email will go to the wrong folder and might (probably will) get lost.**

- Emails that do not follow these rules (e.g., with no subject) will not be answered. Not because we do not want to, but because if we allow us to do this, then we will have even less time to do our job that would have the best possible impact for all of you. And that is unfair. And we do not want this.

# How to contact us?

- For technical questions related to lectures/recitations
  - Classmates
  - Discussion!!!
  - Office Hours TA
  - **Do not email the instructor**
- For questions related to the course, e.g., for concerns about your TA
  - Send me an email
    - (please make sure you give me and yourself enough time for corrections)
- Grading related questions
  - In general, we have a single re-grading policy (more to come)
  - Office Hours (please email)
  - *The instructor is not grading your quizzes*



# VIR – Very Important Rules

If you do not use your scarletmail address, **we will not respond**

**Do not use canvas messages**

as a substitute for (y)our email



# We will not respond to emails...

- If they are **not** coming from a rutgers.edu domain
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***This is required by the law***

# Textbooks

- *Mathematics for Computer Science*
- Lehman, Leighton, and Meyer, 2012
- <https://people.csail.mit.edu/meyer/mcs.pdf>
- K. Rosen, *Discrete Mathematics and Its Applications*, any recent edition.
- J. K. Blitzstein and J. Hwang, *Introduction to Probability*, any edition
- S. Ross, *A First Course in Probability*, any edition
- *Textbooks are not required. You don't need to buy them in order to do well in the course.*

# Course Grading Scheme

- Quizzes (60%) (every 2-3 weeks) – The lowest grade will be dropped
- Midterm (TBA) (15%)
- Final Exam (TBA) (25%)
  - Class Participation (+∞ %)
- **ZERO** tolerance for cheating
  - [Academic integrity policy](#)

# Quizzes Policy

- Role: To ensure that you are absorbing the material and adapt to your learning in real-time
- Time:  
Every other Wednesday, the last 15 minutes of each lecture **OR** During recitation
- The lowest grade will get dropped
  - So, if you miss one quiz, this is your lowest grade
  - No make-up exams (unless for medical or other properly documented reasons)
- Material: Last week's lectures + the recitation material
- Single-regrading policy (be patient about this)

# Single regrading policy

- We (that is, I and the TA's and our grader) ensure that quizzes/hw's are impartially graded
  - Most probably, the problematic question/answer would NOT affect your overall grade for this course
- However, since **accidents do happen**, we allow for a SINGLE-request for regrading your quiz, or homework
- Pick your battle carefully
  - only if you believe the grade is outrageous
- Remember the Class Participation grade (+∞ %)
  - and ***do not worry too much about your grade anyway...***

# How to do well in the course?

- This is a theoretical course
  - You will have to learn how to write some proofs and understand basic concepts
    - Writing proofs is not magic, it's just hard work
- Attend lectures in person and ask questions.
  - There are no stupid questions
- Attend recitations
  - Will introduce **new material**
  - Will involve problem solving similar to quizzes/midterm
- Use us, our office hours, and your classmates **wisely**
- Stay up to date with the material
  - Studying the day before a quiz is a very-very-very **bad** idea.



# How to do well in the course?

- Attend lectures and ask questions
  - There are no stupid questions
- Attend recitations
  - Will introduce new material
  - Will involve problem solving similar to quizzes/midterm
- Form study groups
  - Find a study buddy
- Come to office hours **prepared**
- Stay up to date with the material
  - Studying the day before a quiz/midterm is a **bad** idea.

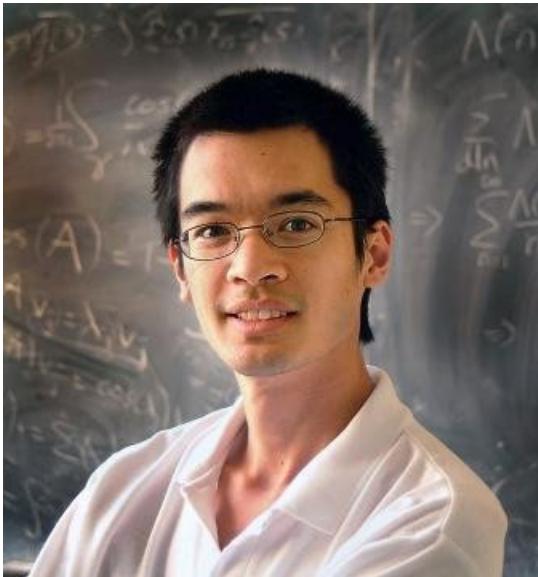
# How to do well in the course?

- Stay up to date with the material
  - Studying the day before a quiz/midterm is a bad idea
  - After each lecture the slides will be posted on canvas
  - Before the end of the day spend ~20 mins going over slides and make notes of things you did not understand
  - Bring questions to next class and office hours
  - When you attend a lecture, have a notepad in front of you (not a PC!!!) and solve (by hand) the problems (till the very end)

# How to do well in the course?

- Lecture format
  - Each lecture will consist of introducing a concept and doing examples related to that concept
  - Extra Problems, quizzes, recitations, study groups will give you more practice on examples related to these concepts
  - The more you practice, the better you will get
    - It does not really matter what we will cover but what you will discover

# How to do well in the course?



**Terence Tao**

World's greatest living  
mathematician.  
2006 Fields Medalist,  
Claymath prize

*"I don't have any magical ability. I look at a problem, and it looks something like one I've done before; I think maybe the idea that worked before will work here. When I was a kid, I had a romanticized notion of mathematics, that hard problems were solved in 'Eureka' moments of inspiration. [But] with me, it's always, 'Let's try this. That gets me part of the way, or that doesn't work. Now let's try this. Oh, there's a little shortcut here.... It's not about being smart or even fast. It's like climbing a cliff: If you're very strong and quick and have a lot of rope, it helps, but you need to devise a good route to get up there. Doing calculations quickly and knowing a lot of facts are like a rock climber with strength, quickness and good tools. You still need a plan – that's the hard part – and **you have to see the bigger picture.**"*

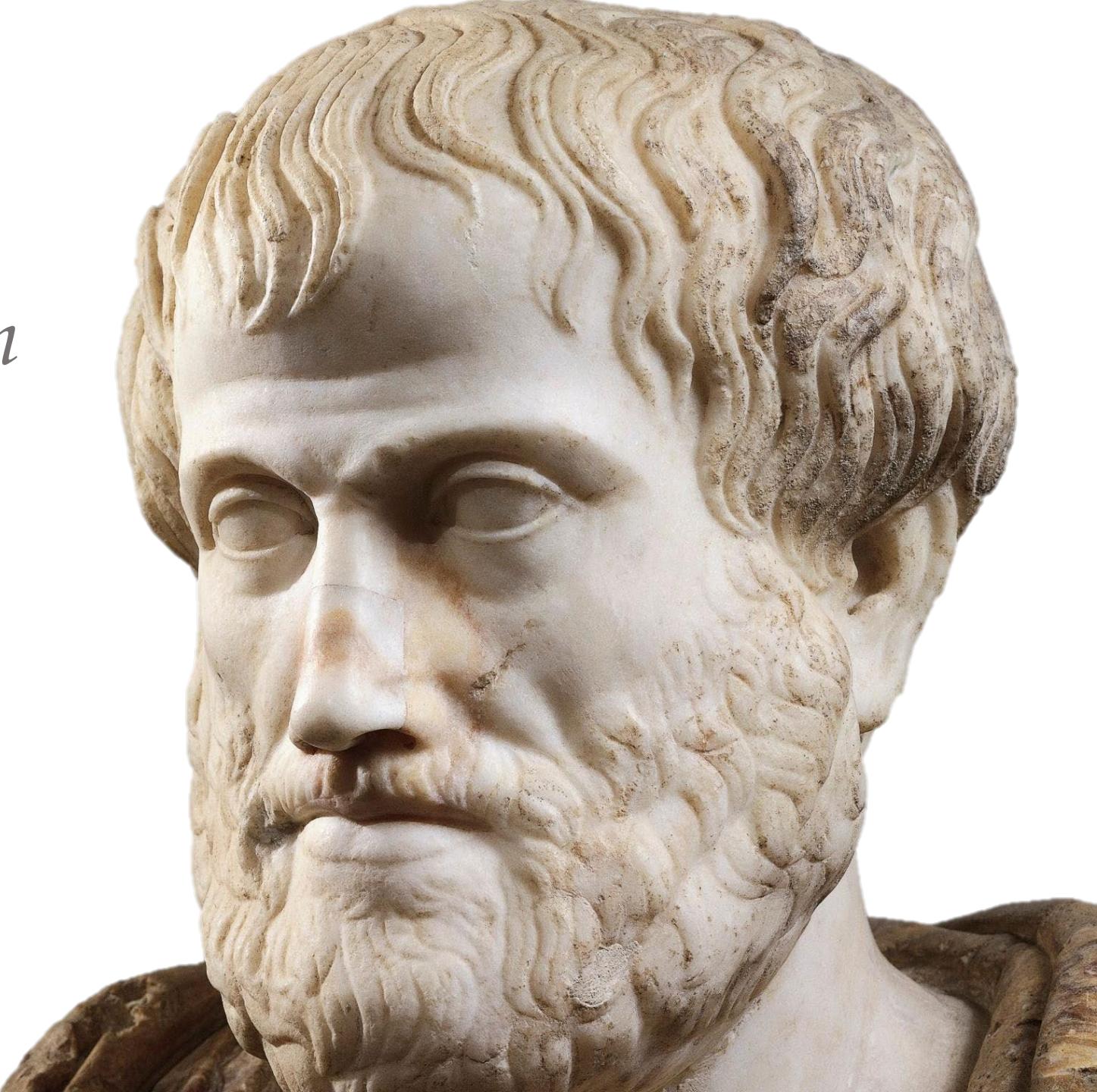
# What is the course about?

- This is an introductory course in combinatorics and probability theory, two branches of mathematics that are of fundamental importance in computer science
  - Combinatorics
  - Probability Theory
  - Graph Theory

# Lecture Structures

- 14:00 (sharp) Review of previous lecture
  - Note: This is a review, not a repetition, so some things will still be new (or seen under a new perspective, typically more thorough)
  - Do not use this review as a substitute for the entire previous lecture
- 14:15 Lecture on new material
- **14:40 BREAK**
  - I am going to try this for the first time
- 14:45 Example Problems
  - Have a notepad next to you
  - Use it! (Take notes, solve problems, even the ones I solve as examples)
- 15:10 Wrap-Up – Take Home Messages

*The roots of education  
are bitter,  
but the fruit  
is sweet*



Aristotle, 384 – 322 BC

