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a roadmap to success in...

206
Discrete Structures II

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Computer Science | Rutgers University | NJ, USA

What is success?

a roadmap to success in...

Getting an A?

Getting an A without trying too much?

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!*

The challenges this year

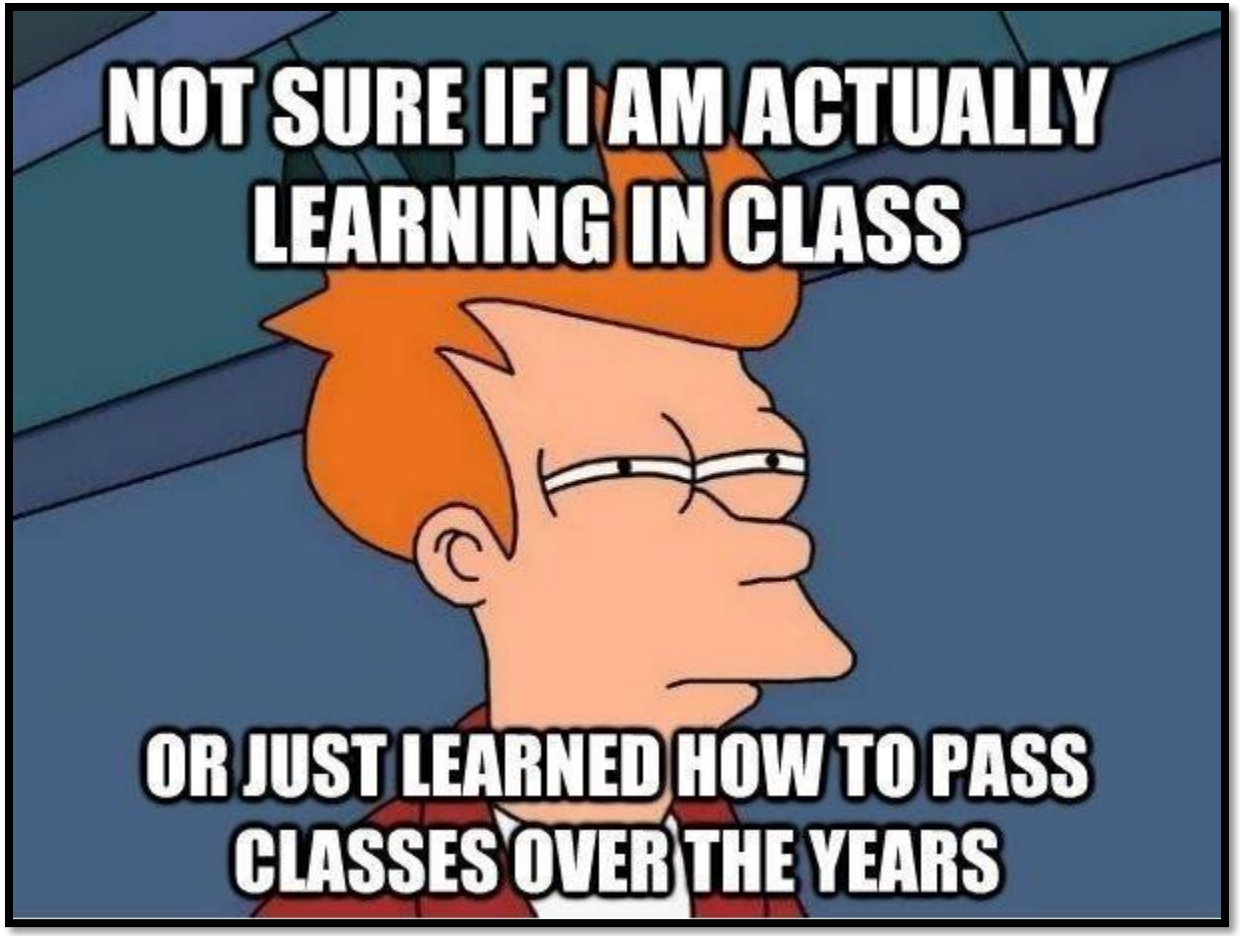
~140 students (Sections 4, 5, 6)

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**, **<u>you will get an A</u>**
  - Trust me:
    - Around 60% of the class got an A in Fall 2019
    - Around 70% of the class got an A in Spring 2021
    - Less than 5% failed the class (and despite me chasing them…)
  - The rest 35% did not trust me enough to do **a** and **b**



Who

1 instructor (lectures)

2 TA’s (in-person recitations)

2 Graders (quizzes/assignments)

Instructor

Konstantinos Michmizos

michmizos@cs.rutgers.edu

Research Interests:

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

Office Hours
Thursdays 12.00-13.00

Email me first
to ask for a specific time slot
and for a specific issue

Who

Who

2001

2004

UG Researcher

Signal Processing & Analysis

Hippo-campus

2006

M. Eng.

Biomimetic Robotics

Oculomotor System

2011

Ph. D.

Computational Neuroscience

Basal Ganglia & DBS

2013

Post-Doc

Neuro-Habilitation Robotics

Children with Cerebral Palsy

2015

Computa-tional Brain

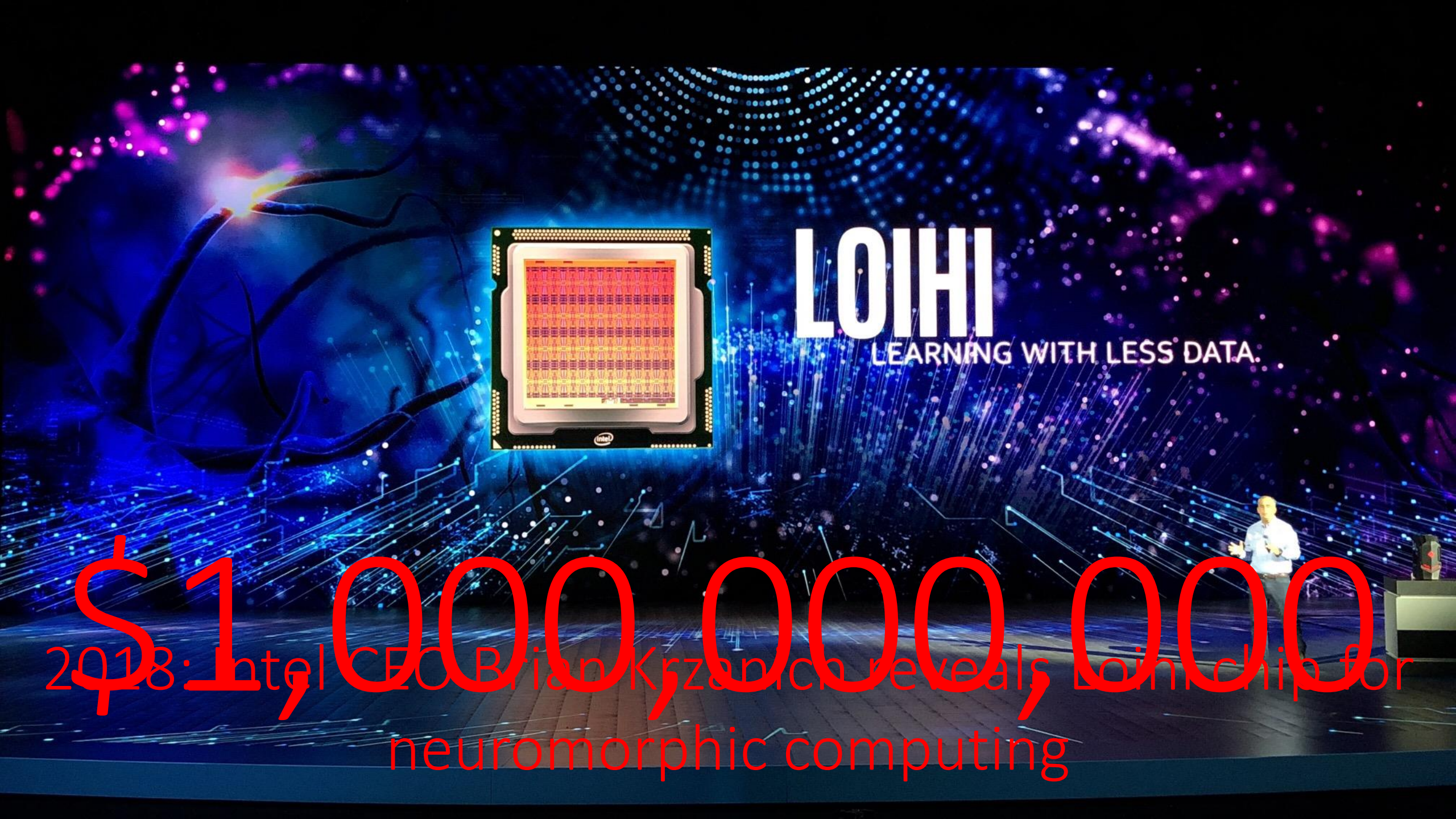
Modeling and Analysis

2021

MEG and Modeling

Children with Autism

Is this science fiction?



$1,000,000,000

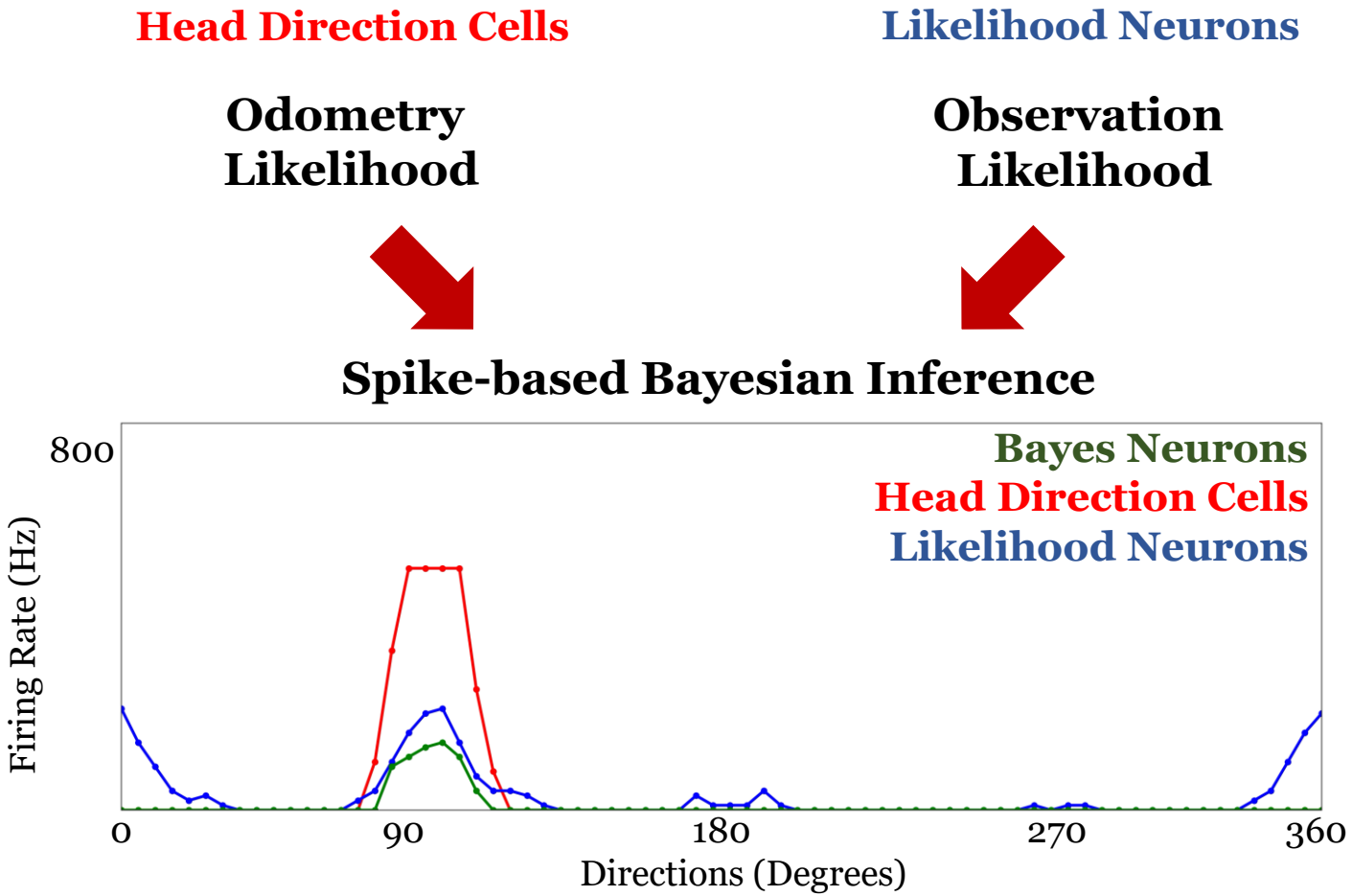
2018: Intel CEO Brian Krzanich reveals Loihi chip for neuromorphic computing

Bayesian Inference Network on Loihi

Who

Experiment 1: 24s to 34s

Speed x2



Who

TAs

- **Yuequn Zhang, PhDc**
  - Office Hours: TBD
  - Recitation Section: TBD
- **Vladimir Ivanov, PhDc**
  - Office Hours: TBD
  - Recitation Section: TBD

Section 4: Tuesday 5:00 PM - 5:55 PM

Section 5: Thursday 3:00 PM - 3:55 PM

Section 6: Thursday 3:00 PM - 3:55 PM

Recitations start on Sept 7th

Would you fly this airline?

How?

1. canvas – set up your notifications now to receive announcements in real-time

2. This class has ~140 students. That means that we will be handling ~140 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 energy to help all students, if you do not follow the rules, you will most probably not get an answer (especially when your question is outrageous – e.g., “where can I find these rules that I have heard about?” or… “Where can I find notifications on canvas?”)

Course Info

- Canvas
  - Lecture Recordings
  - Homework, lecture slides, announcements, assignments, 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
    - *Do not post homework solutions/hints*

How to contact us?

- For technical questions related to lectures/recitations
  - Classmates
  - Discussion!!!
  - Office Hours
  - **Do not email**
- 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

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 (70%) (every 2-3 weeks)
- Assignments (30%) (every month or so)

- ~~Midterm (TBA) (15%)~~
- ~~Assignment (10%)~~
- ~~Final Exam (TBA) (25%)~~

    - Class Participation (+∞ %)

- **ZERO** tolerance for cheating
    - Academic integrity policy

Quizzes Policy

- Role: To ensure that you are actively absorbing the required material

- Time: Every other Thursday, the last 15 minutes on 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)

The person **next** to you does not know more than you do!

Assignments Policy

- Submit via canvas
- Preferably a pdf file, typeset in LaTex
  - Can be handwritten/scanned
  - Write legibly otherwise no points
- Late homeworks not accepted – no excuses
  - Especially when they come 1-2 days before the dealine
- Single-regrading policy (see next slide)

Start Early!

Single regrading policy

- We (that is, I and the TA's and our graders) 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.

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.

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

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

- 13:00 (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
- 13:15 Lecture on new material
- 13:40 BREAK
  - I am going to try this for the first time – to fight fatigue (all kinds of fatigue…)
- 13:45 Example Problems
  - Have a notepad next to you
  - Use it! (Take notes, solve problems, even the ones I solve as examples)
- 14:10 Wrap-Up – Take Home Messages