# Introduction to Deep Learning

**0. Logistics**

**Spring 2026**

**Presented By:**
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**Shadow Instructor**
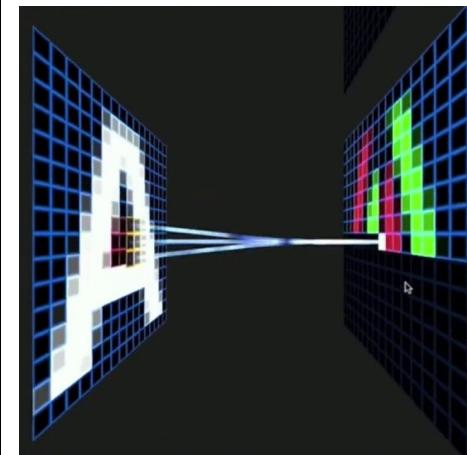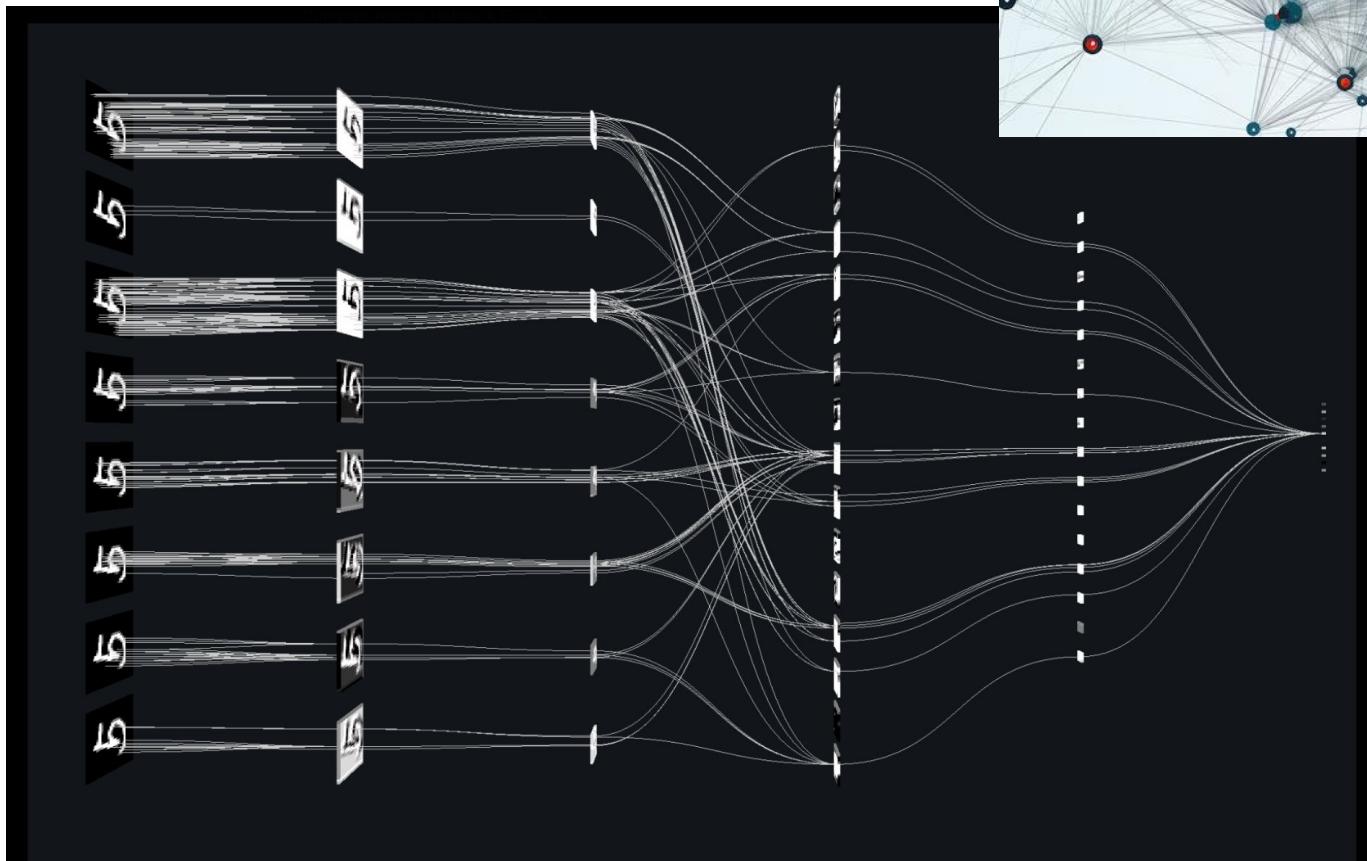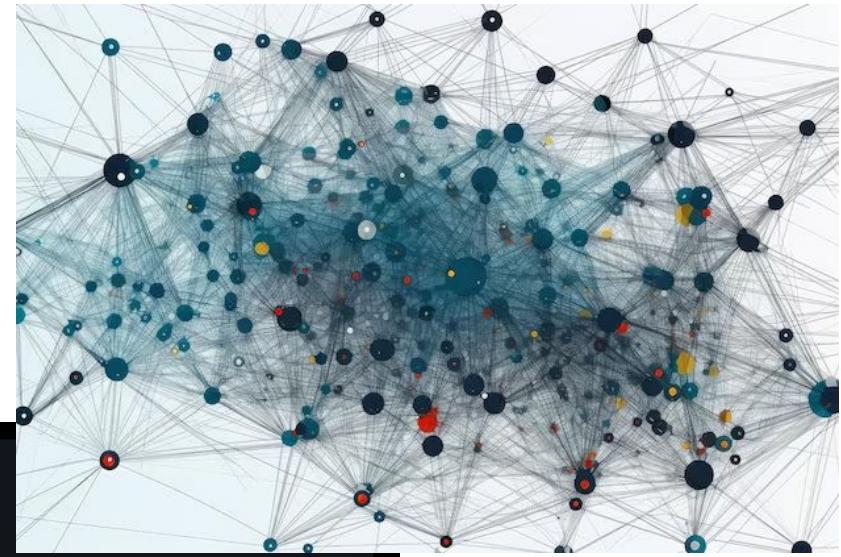
# Outline

- Introduction
- The Instructor, TAs, Course Topics, and You
- The ~~Chickens~~ Challenge of the Course
- Components of the Course
- "Go the extra mile"
- Components of the Grade
- Common Sense and Integrity

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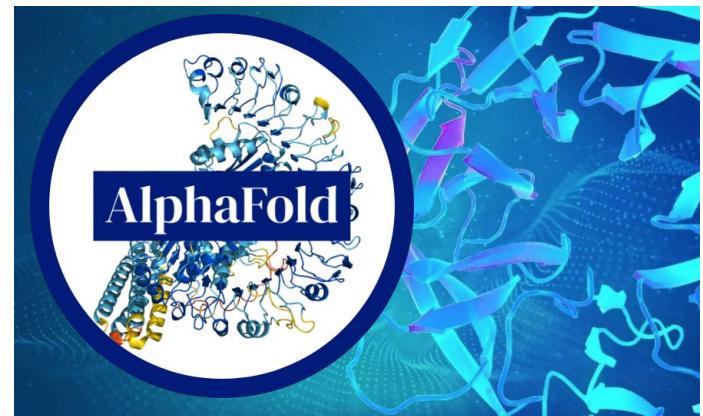
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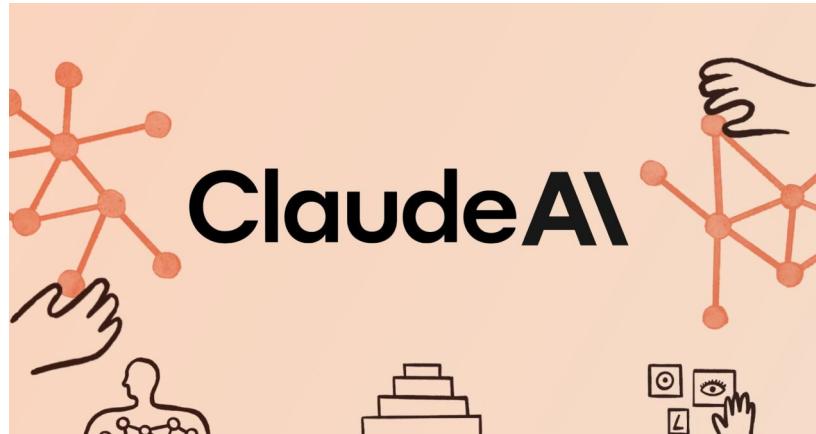
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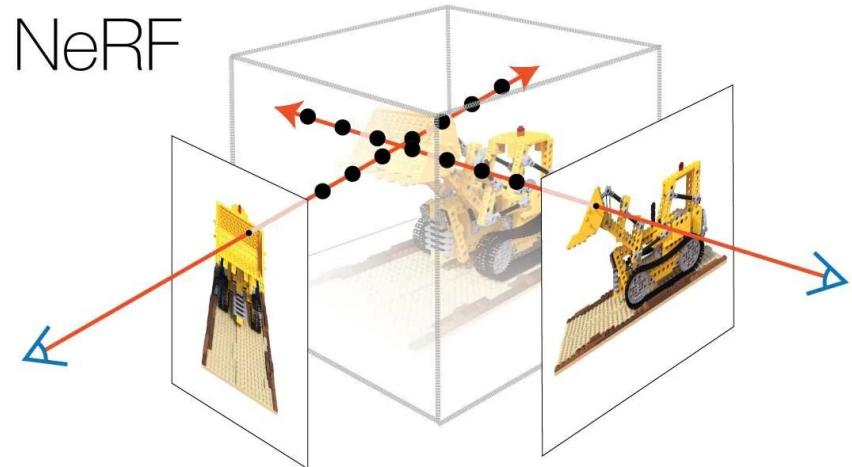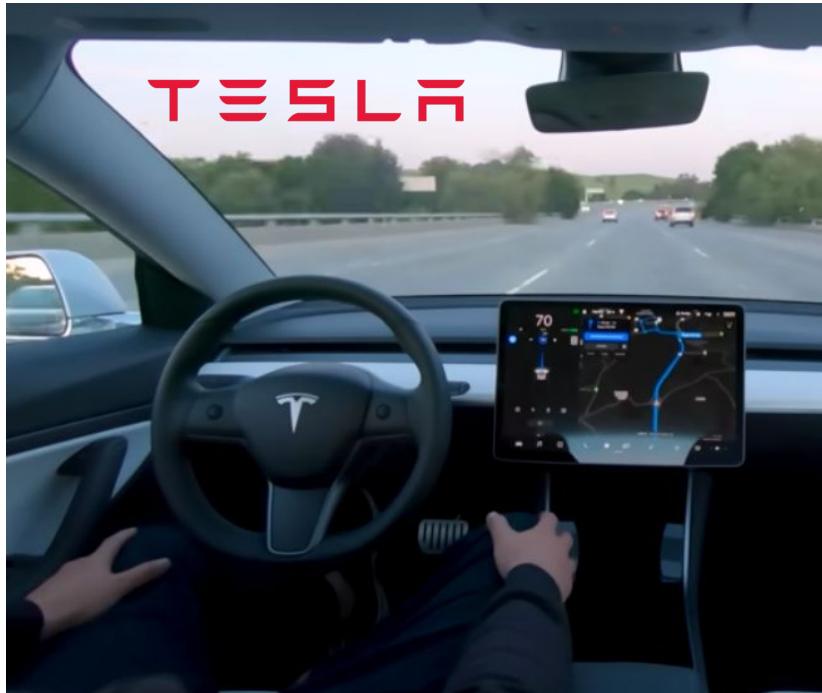
# Breakthroughs

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# Instructor and TAs

- Instructor:
  - Bhiksha Raj
  - Rita Singh

- TAs:
  - List of TAs, with email ids on course page
  - We have TAs from the Pittsburgh, Kigali, and Silicon Valley Campuses
  - Remote and in-person office hours are provided

- Office hours: see course webpage https://deeplearning.cs.cmu.edu

# Who is the course designed for?

- Required Classes
  - Fundamental of Programming (or equivalent) -
  - Python, PyTorch

- Highly Recommended Classes:
  - Calculus and Linear Algebra

- Nice to have:
  - Vector Calculus and Software Engineering

# General Course Topics

- **Introductory Network Structures**
  - Multilayer Perceptrons
  - Convolutional Neural Networks
  - Recurrent Neural Networks
  - Boltzmann Machines
- **Beyond the Basics**
  - Generative models: VAEs
  - Adversarial models: GANs
  - Graph Neural Networks
  - Transformers
- **Practical Focus Areas:**
  - Computer vision: recognizing images
  - Text processing: modelling and generating language
  - Machine translation: Sequence to sequence modelling
  - Modelling distributions and generating data
  - Speech recognition

# Who is the course designed for?

- This course is implementation heavy
  - There is a lot of coding
  - There is a lot of experimenting
  - You will work with some large datasets

- Course Language of choice: Python

- Course Toolkit of choice: PyTorch
  - You are welcome to use other languages/toolkits, but the TAs will not be able to help with coding/homework

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# *This course is not easy*

- A lot of work!

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- A lot of work!!!
- **A LOT OF WORK!!!!**

Not for chickens!

# *This course is not easy*

- A lot of work!
- A lot of work!!
- A lot of work!!!
- **A LOT OF WORK!!!!**



- But a lot of fun :)

# *This course is not easy*

- *Mastery-based* evaluation
  - Quizzes to test your understanding of topics covered in the lectures
  - HWs to teach you to implement complex networks and optimize them to high degree
  - For non-485 students, projects to expose you to real world DL problems
  - **FYI: Anyone who gets an "A" in the course is technically ready for a deep learning job**

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# Lectures

- In-class lectures
  - Live streaming for remote sections
  - Lectures will also be recorded and uploaded to the course website
- Importance of viewing lectures
  - Even if you think you know the topic
  - Quizzes: your marks depend on viewing lectures
  - We monitor attendance (more on this later)

*some lectures may be conducted entirely over zoom.*

# Weekly Quizzes

- Questions are related to topics covered that week
  - In lecture slides
  - Released Fridays @ 11:59PM EST
  - Closed Sundays @ 11:59PM EST
  - (this may occasionally shift, don't panic!)
- 14 total quizzes
  - We accept the best 12 (you may skip 2)
    - This is expected to account for any circumstance-based inability to work on quizzes
- Each has 10 multiple-choice questions
  - We accept the best of 3 attempts per quiz

# Recitations, Hackathons, and Bootcamps

*We strongly recommend you attend all recitations, hackathons, and bootcamps.*

- Recitations
  - 14 recitations, held on Fridays in the lecture room
  - It is hands-on and will cover implementation specifics while you follow along
- Hackathons
  - 14 hackathons, held on Saturdays
  - In-person in Pittsburgh and Kigali (room TBD)
  - It is a giant office hour session with pizza
- Bootcamps
  - 4 bootcamps, one for each HW (+1 for Guided Project)
  - Held on Saturdays before hackathon
  - It will cover HW implementation specifics while you follow along

# **Assignments**

- There will be four main HWs, bonus HWs, and an autograd bonus
- Main HWs all have two parts:
  - Part 1: Autograded problems with deterministic solutions
    - You must upload them to autolab and CHECK YOUR SCORE
  - Part 2: Open problems posted on Kaggle
- HW Bonus and Autograd Bonus:
  - There will be bonus homeworks associated with some (or all) of the homeworks; there will also be a separate autograd bonus homework.
  - These marks will not contribute to final grading curves and give you the chance to make up for marks missed elsewhere

# Study Groups



- ***Everyone must join a study group***
- ***Each study group will be assigned a TA mentor for help throughout the course***
- We recommend study groups of 3-4 people
- If you do not have a study group, we will form one for you
  - Please register via forms we post on Piazza

# Course Project

- **If you're taking 11-785, you will do an original project**
- If you're taking 11-685, you will do a project "Guided Project"
- <u>If you're taking 11-485 this slide does not apply to you</u>

- Projects are intended to exercise your ability to comprehend and implement ideas beyond those covered by the HWs

- Projects can range from
  - Implementation and evaluation of cutting-edge ideas from recent papers
  - Problem-solving that might lead to publication, if completed well
  - New models/learning algorithms/techniques, with proper evaluation
  - *Verification* of results from "hot" published work

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# Lecture Attendance

- You get marks for attendance (i.e. class participation)
  - Our performance metrics over the semesters show a distinct correlation between attendance and course scores
  - We also note a distinct *inverse* correlation between attendance and the amount of help you require on piazza and during office hours
  - To encourage attendance, we assign 1 mark for attendance
    - 1% of your total grade for 11685 and 11785
    - 1.3333% of your total grade for 11485
    - This can be the difference between a B and an A

- We will track lecture attendance through Polls

# Recitation 0 & HW1p1

- If you have any doubts about your preparations for this course, please, please, please, please go through the videos for Recitation-0 and complete the notebook exercises
  - Gain comfort with the coding required in the homeworks, early on
  - Info on Compute Infrastructure:

    Amazon tokens (AWS) will be provided

    Google Cloud Platform (GCP)

    Kaggle

- HW1 Part 1 has components intended to help you *later* in the course

# Course Communication

**Piazza**

- Lecture and Attendance Polls
- Questions and Answers
- Announcements and Reminders
- Student Collaboration
- Instructor Notes

*https://piazza.com/*

# Reading Materials

- Free resource: *'Dive Into Deep Learning'* (interactive Jupyter notebooks).

- Recommended: François Chollet's *'Deep Learning with Python'* (Second Edition)

- Additional reading material will also appear on the course pages

# Study groups

- What study groups may do:
  - Discuss homework problems and solutions
  - Discuss papers
  - Discuss class work
  - Discuss quizzes

- We encourage you to meet regularly to discuss IDL work

- Study groups may also go on to form project teams

# Study Group Mentors

- Every study group will be assigned a TA mentor
  - We will track your progress and reach out to you if you appear to be in trouble

- If in trouble, first reach out to your TA mentor
  - If you feel you're falling behind, reach out to your mentor
  - If you feel you are struggling, reach out to your mentor
  - If you feel pressured/unable to cope, reach out to your mentor
  - We will try our best to help you

- We aim to make this a successful course for all of you
  - In our intro to deep learning, ID(ea)L world, everyone performs well enough to get an A *without lowered standards*
    - i.e. we would like to bring you all up to where we believe you deserve an A
  - Everything about this course is geared to this objective

# Project Group Mentors

- Every project group will be assigned at least one TA mentor
  - We will track your progress and be in touch about your project status throughout the semester

- You are allowed to seek a "external" mentor who has more expertise in your topic of interest
  - If you need more guidance and expertise

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# Evaluation

- Scores are evaluated based on 3 types of tests:
    - Attendance
    - Weekly Quizzes
    - HW Assignments
    - Team Project or Guided Project (not for 11-485 students)

# Lecture Attendance: Rules

- You must either attend the lectures in person, or watch via zoom
  - With some exceptions: see below
  - **We get attendance stats from your participation during in-class polls**
  - Polls will be conducted via Piazza for in-person lectures. It is recommended to use the Piazza app available both on Android and iOS.
  - Lectures conducted over zoom will use zoom polls
  - **Use of electronic devices during in-person lectures is not permitted except during polls**

- Students in SV, and in other time zones where your local time is before 8am or after 5pm for the class, may alternately watch recorded lectures on mediatech instead
  - Mediatech records who watched and for how long. Entire lectures must be viewed.
  - If viewed on mediatech, the lectures of each week must be viewed before 8AM of the Monday following the following week
    - Otherwise, it doesn't count

- The precise mechanism for computing the class participation score from attendance will be decided at the end of the semester. **Our advice to you: just attend**

# Weekly Quizzes

- Slides often contain a lot more information than what is presented in class

- *Quizzes will contain questions from topics that are on the slides, but not presented in class*

- *Will also include topics covered in class, but not on online slides!*

- Sometimes there will be questions based on latest research papers in the quiz – the links to the papers will be provided

# Homework: Part 1

- HW Part-1s evaluate your ability to code neural nets on your own from scratch
  - If you implement all mandatory and bonus questions of part 1 of all homeworks, you will, hopefully, have all components necessary to construct a little neural network toolkit of your own
    - "mytorch" ☺
- The homeworks are autograded
  - Be careful about following instructions carefully
    - The autograder is setup on a computer with specific versions of various packages
    - Your code must conform to their restrictions, if not the autograder will often fail and give you errors or 0 marks, even if your code is functional on your own computer
  - Note: you get some bonus points if you submit the homework early

# Homework: Part 2

- HW Part-2s test your ability to solve complex problems on real-world data sets
  - Unlike part-1s, initial early submissions are required and worth 10/100 points (to show you have gotten started)
  - The remaining 90/100 points are determined by your final score relative to the cutoffs

# Homework: Part 2

- The standard cutoffs are (After 10 pts ESD)
    - High cutoff          : 90 pts
    - Medium cutoff     : 70 pts
    - Low cutoff          : 50 pts
    - Very Low           : 30 pts
      cutoff               : 0 pts
    - No submission
- Your score is linearly interpolated between cutoffs. Ex, if an 85% accuracy model is for the high cutoff and 75% model is for the medium, a model with 80% accuracy will get 82.5/90 pts

- There is a 5th bonus cutoff for extra credits (10 pts) determined by the highest scoring student
    - Ex. If the highest accuracy is 92%, the scoring student will get 110/100 and anyone between 85% to 92% will get 100+/100 (assuming they have 10 bonus points from early submission)

# Course Project

- Teams: think about forming project teams as soon as possible (we may help, too)
  - 11-785 teams are of 3-4 students maximum
  - 11-685 teams are of 2-3 students maximum
- Project requirements:
  - Report:
    - Submit a project proposal by the proposal deadline listed on the website
    - Submit an initial report 3⁄4 way through the semester
    - Submit an updated report draft 3 days **before the presentation due date**
    - Submit a final report during finals week, at the end of the semester
  - Video:
    - Make a **5 min** video presentation of the project at the end of the semester
    - The video can be presented by one, some, or all team members
    - Video should explain the problem, proposed solution, and evaluation
    - Defend your project by answering questions about your video, on Piazza
- The project is often the most enjoyable portion of the course

# Grading

| **Weekly Quizzes** | | **24** |
|---|---|---|
| 14 Quizzes, bottom two dropped | | 24 |

| **Assignments** | | **50** |
|---|---|---|
| HW1 – Basic MLPs | (AL + Kaggle) | 12.5 |
| HW2 – CNNs | (AL + Kaggle) | 12.5 |
| HW3 – RNNs | (AL + Kaggle) | 12.5 |
| HW4 – Sequence to Sequence Modelling | (AL + Kaggle) | 12.5 |

| **Team Project (Not for 11-485)** | **25** |
|---|---|
| Proposal | - |
| Mid-term Report | 5 |
| Preliminary Full Report | - |
| Project Presentation | 10 |
| Peer Reviewing | binary multiplier |
| Final report | 10 |

**\* Note: There is 1 mark for attendance**

# Homework Deadlines

- There are separate deadlines for Part-1s and Part-2s
- HW Part-2s have multiple deadlines
  - *Early Submission D*eadline: worth 10% of Part-2 and affirms you have started the assignment
  - *On-time Submission Deadline:* determines your eligibility for full cutoff marks
  - *Late/Slack Deadline:* everyone gets up to 10 total slack days **(does not apply to initial submissions, all bonus points, nor HW Part**-**1s)** -- you can distribute them as you want across your HWs, and once you use up your slack days, all subsequent late submissions will accrue a 10% penalty (on top of any other penalties)
- Note: Kaggle: Kaggle leaderboards stop showing updates on full-submission deadline
  - We will continue to accept submissions until you run out of slack days (the drop-dead deadline)
- *Please refer to the course webpage for a complete set of policies*

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# Common Sense Piazza Posts

- Feel free to post on piazza for any clarification or doubts
- We strive to respond to student queries immediately
- **With Regards to Code-Related Questions on Piazza..**
  - Make a good title to your question, on the post.
  - Describe the problem concisely and clearly.
  - Include relevant, short code blocks if necessary... **do not paste entire notebooks or python files, please!**
  - Explain your debugging process:
    - What you tried, initially (prior to error)
    - The results you got
    - The errors and **expanded stack traces**
    - What you tried, subsequently (after the error)
    - What roadblock are you stuck at now / what do you need help understanding?

# Personal and Academic Integrity

- You are here to learn DL yourself, not to demonstrate how well you can pretend to learn

- You are at CMU – which means you are among the brightest and best students in the *world*
  - You probably were among the top students in your peer group all your life, before you came here
  - It will be an insult to yourself, to lower your integrity

- **Try your best, honestly.** If you are unsure about something, reach out to us

# Integrity and Study Groups

- Every student must solve their quizzes by themselves
  - You may discuss the questions with your study groups/friends, but when you solve the quiz, **isolate yourself and do it alone**

- Every student must solve every homework by themselves
  - You may discuss the homeworks with your friends, and even help them debug their code, but when you finally solve it, every line of your code (except libraries that have been okayed by course staff) must be written by you
  - Your solution must be yours

- Plagiarizing code from the web or your friends constitutes an academic integrity violation
  - Submitting any solutions not obtained by you constitutes an AIV

**Thank you for deciding to take this journey of Deep Learning with us**


**- Prof. Bhiksha and TAs**