

# **CS342:** **NEURAL** **NETWORKS**

Prof. Alexander Huth  
2021.1.18

# TODAY

- \* Logistics
- \* Syllabus
- \* Overview of class
- \* Background survey

# TODAY

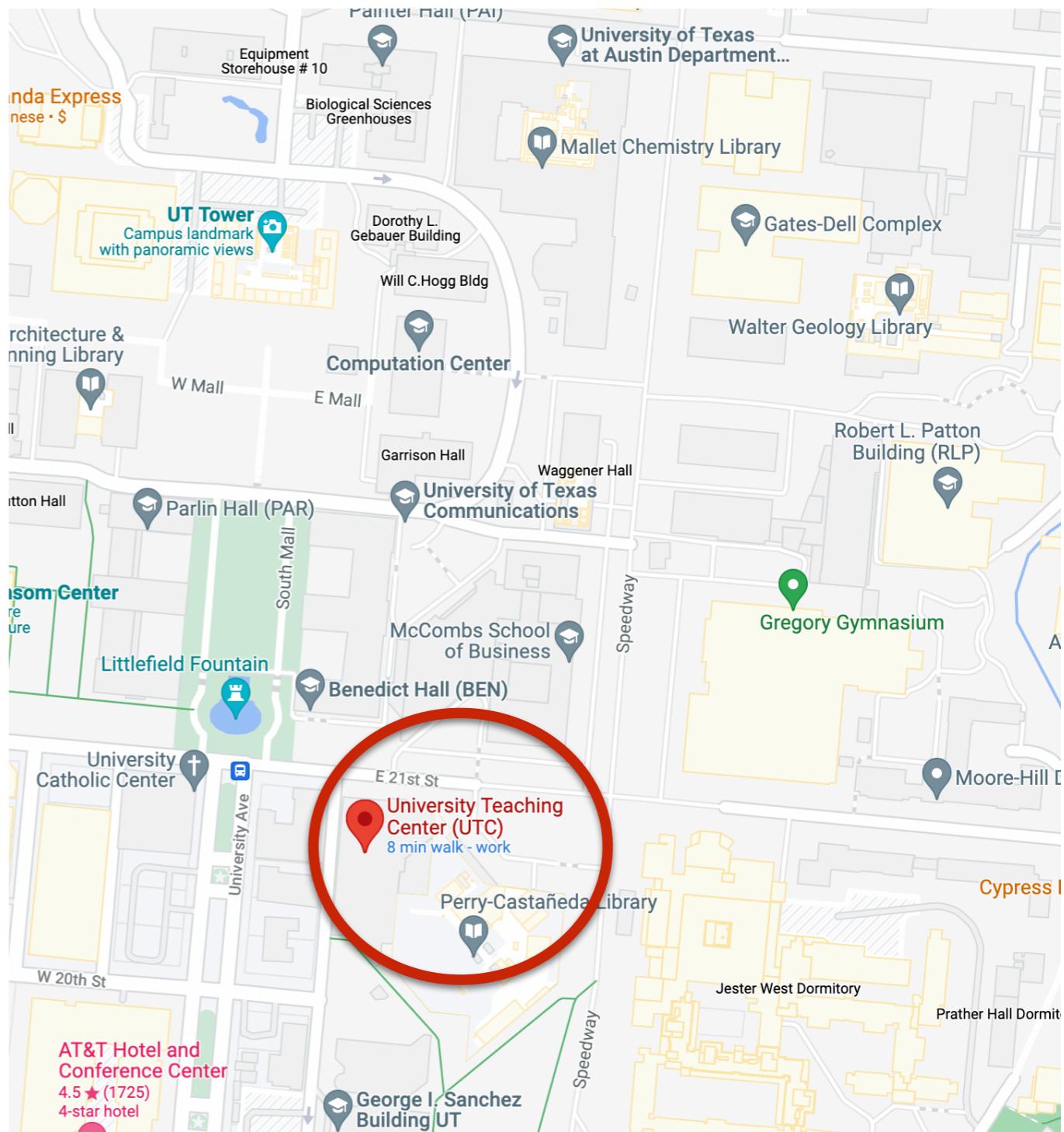
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# INSTRUCTOR

- \* Professor
  - \* Alex Huth (me)
  - \* Depts. of Computer Science & Neuroscience
- \* TA
  - \* Shailee Jain
  - \* PhD student, Dept. of Computer Science

# LOGISTICS

- \* *Online only through January*
- \* In-person thereafter in **UTC 4.104** (barring further changes)



# LOGISTICS

- \* All in-person lectures will be streamed over Zoom and recorded
- \* You will be free to attend any lecture online with no penalty
- \* If you are sick, **please watch lectures from home** instead of coming to class

# MASKS

- \* **Strongly** recommended
- \* If possible, use N95/KN95/  
KF94 masks, which protect  
*YOU* much better than  
surgical or cloth masks



# LOGISTICS

- \* When/if you come to class in-person, you will need to bring a laptop or phone to do Canvas quizzes
- \* For communicating with me & the TA (Shailee Jain), please use Canvas messages or email

# LOGISTICS

- \* Office hours will be on Zoom
  - \* Professor's office hours will be 4:00pm-5:30pm Tuesdays, and 10:30am-12:00pm Thursdays
  - \* TA's office hours are TBD

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# SYLLABUS

- \* Lecture-based course
  - \* Lectures Tue/Thu by me or a guest lecturer
- \* There is no textbook
  - \* For some topics there will be readings (textbook chapters, papers, or websites) which will be posted to canvas

# SYLLABUS

- \* Grade:
  - \* Homeworks (50%) – there will be 5 homeworks, each worth 10% of course grade
  - \* Quizzes (15%) – there will be ~14 short in-class quizzes. Lowest score will be dropped
  - \* Final project (35%)

# SYLLABUS

- \* Homeworks (50% of course grade)
  - \* There will be 5 HWs, each worth 10% of course grade
  - \* HW will be due **by start of class** (i.e. 2pm) on the due date
  - \* Only HW turned in on time will be eligible for full points
  - \* HW <1 week late will be docked 10%, HW >1 week late will not be accepted
  - \* You have one free 1-week extension with no questions asked
  - \* Further extensions may be granted if you ask *before* the HW is due

# SYLLABUS

- \* Homeworks will take the form of Jupyter notebooks (.ipynb files), and will include coding as well as some short-answer questions and some math
- \* You will need to upload completed homework to Canvas

# SYLLABUS

- \* You may work together with other students on homework, but *what you turn in must reflect your own work*
- \* If you work with others, please include a message like “I worked with ABC and XYZ on this homework” in the space provided at the top of the homework notebook

# SYLLABUS

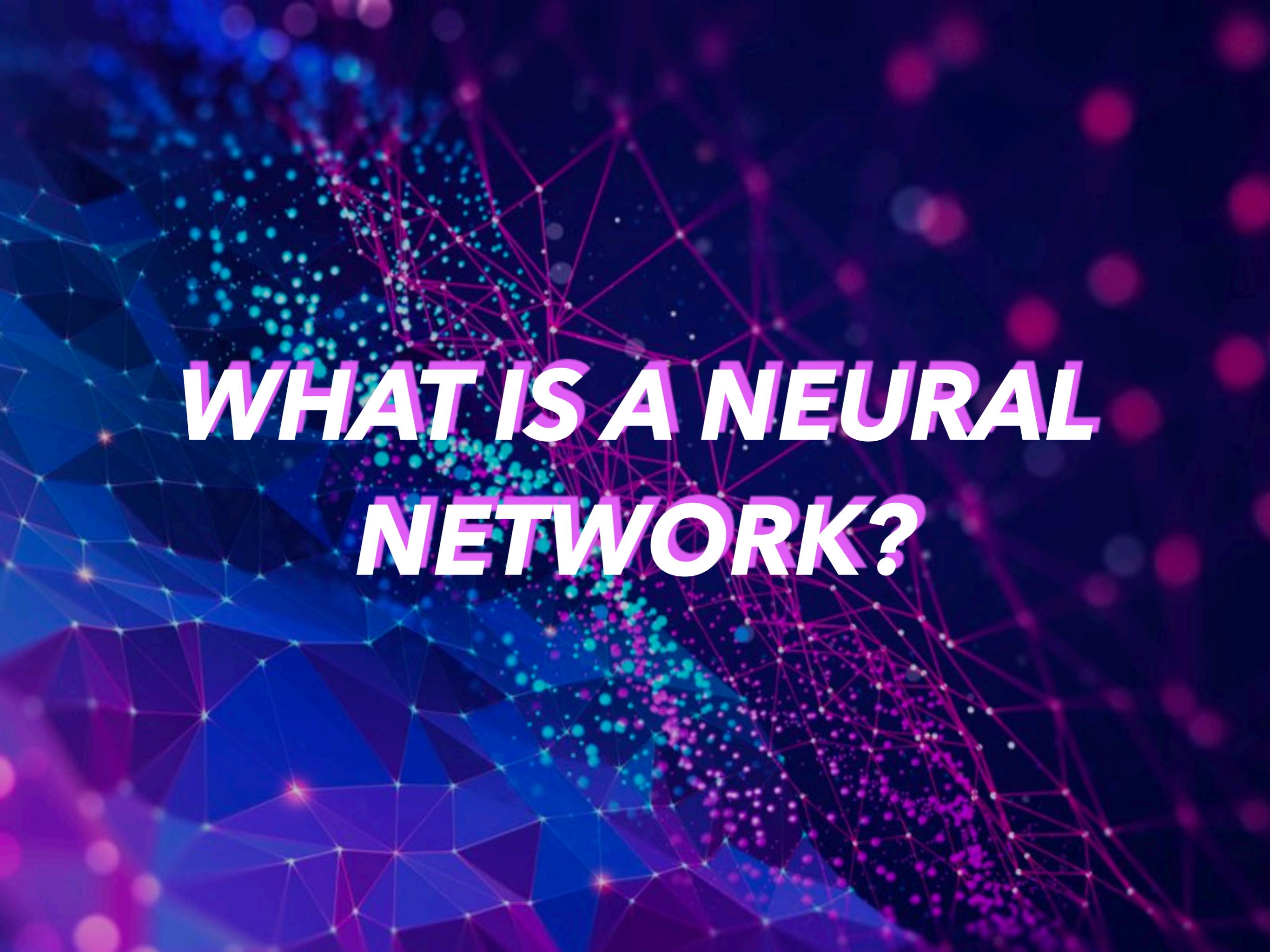
- \* Quizzes (15% of course grade)
  - \* There will be ~14 short in-class quizzes (5-10 minutes), one every Tuesday
  - \* These will cover the material discussed in the previous week
  - \* Lowest score will be dropped

# SYLLABUS

- \* Final project (35% of course grade)
  - \* Done solo or in groups of ≤4 students
  - \* Grade includes a proposal (5% of course; due 3/31), & writeup/presentation (30% of course)
  - \* Presentations may be in-person (e.g. poster style) or virtual (e.g. recorded videos) depending on COVID situation in May

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A dark blue and purple abstract background featuring a complex network of glowing nodes and connecting lines, resembling a neural network or a starry sky.

**WHAT IS A NEURAL  
NETWORK?**



 **Ayush Patel**  
@ayushpatel34



Here's #gpt3 writing some SQL for me.

Text: Select the "Students" from the "School" table joined with "Class" table:  
Code: `SELECT * FROM Students  
INNER JOIN Class  
ON Students.ID = Class.StudentID`



ALPHAGO 00:08:32

BBC NEWS

LEE SEDOL 00:00:27

Google Translate

# (ARTIFICIAL) NEURAL NETWORKS

- \* A model of computation
- \* Consisting of many ~identical units
- \* That are connected to one another
- \* Where the connection strengths determine what is computed

# THIS COURSE

- \* Five modules:
  - \* Neural network basics
  - \* Convolutional neural networks
  - \* Recurrent neural networks
  - \* Transformers / Self-attention networks
  - \* Special topics (reinforcement learning, non-gradient learning, biological neural networks, bias & fairness)

# BACKGROUND?

- \* Who are **you**? Drop a note in the chat with your major, year, and why you're taking this class!

# BACKGROUND?

- \* What do you already know? What do you hope to learn?
- \* Please take the **Background Survey** "Quiz" on Canvas: <https://utexas.instructure.com/courses/1331607/quizzes/1654717>
- \* (Submissions are anonymous & there are no wrong answers, but you will only get credit if you do it)

**THAT'S ALL FOR  
TODAY**