

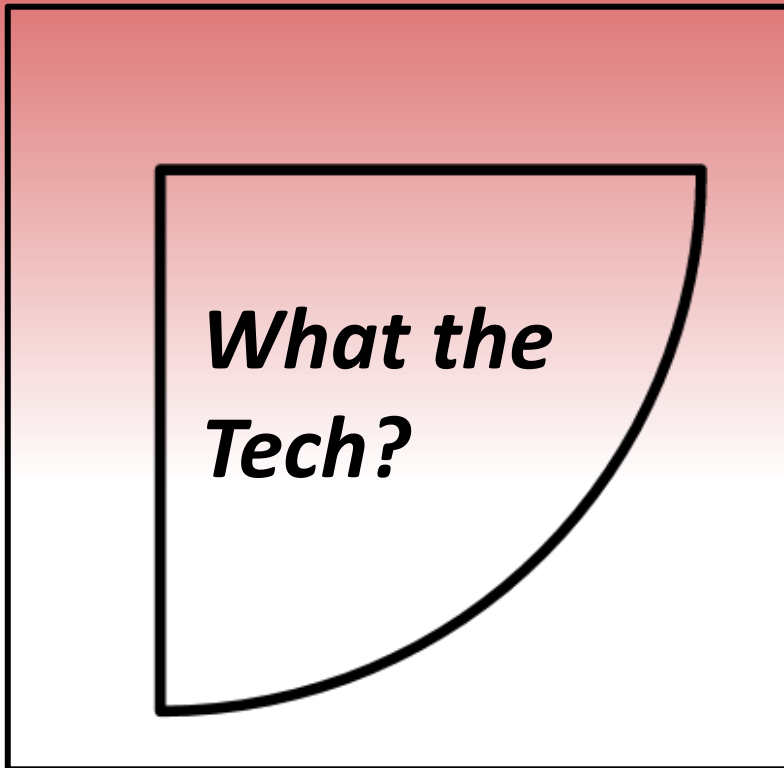
What the Tech?

Part 2

Popping The Hood on AI



AI: Popping the Hood



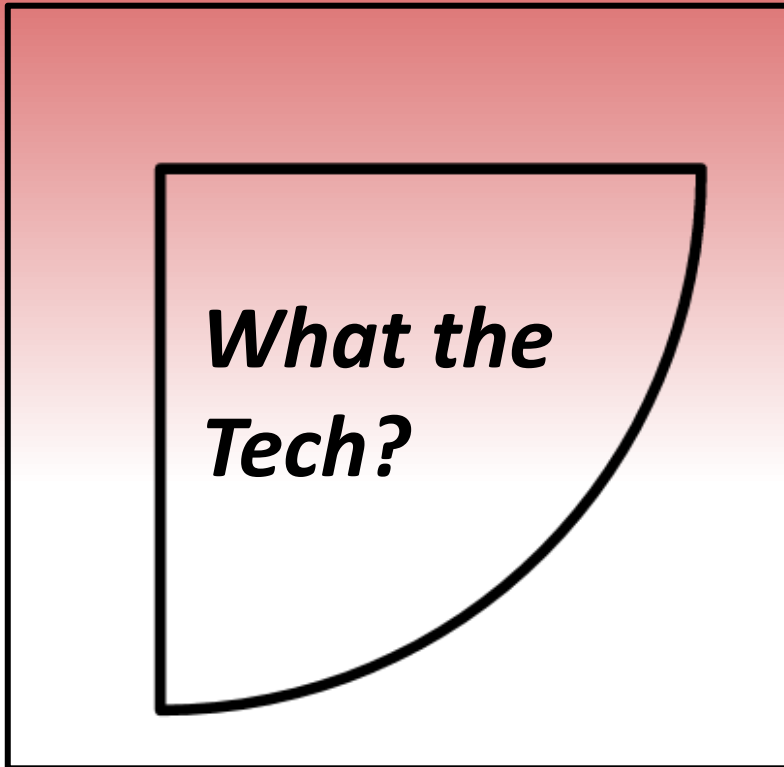
Last week, we discussed...

- The workshop
- Our goals
- Ourselves
- A brief history of AI
- Society, Tech, Community & AI

Any questions? Refreshers?



AI: Popping the Hood



Today will be about...

- Sharing our first weekly reflections!
- Key terms
- Close Look: How AI Works
- Activity: ChatGPT



Questions so far?

Next: Our Weekly Reflections



Weekly Reflections

How it works

- Goal: everyone goes once!
- Three volunteers per week
- Three new volunteers each week

Every Monday

- Week 2 (today):
- Week 3:
- Week 4:
- Week 5:
- Week 7:

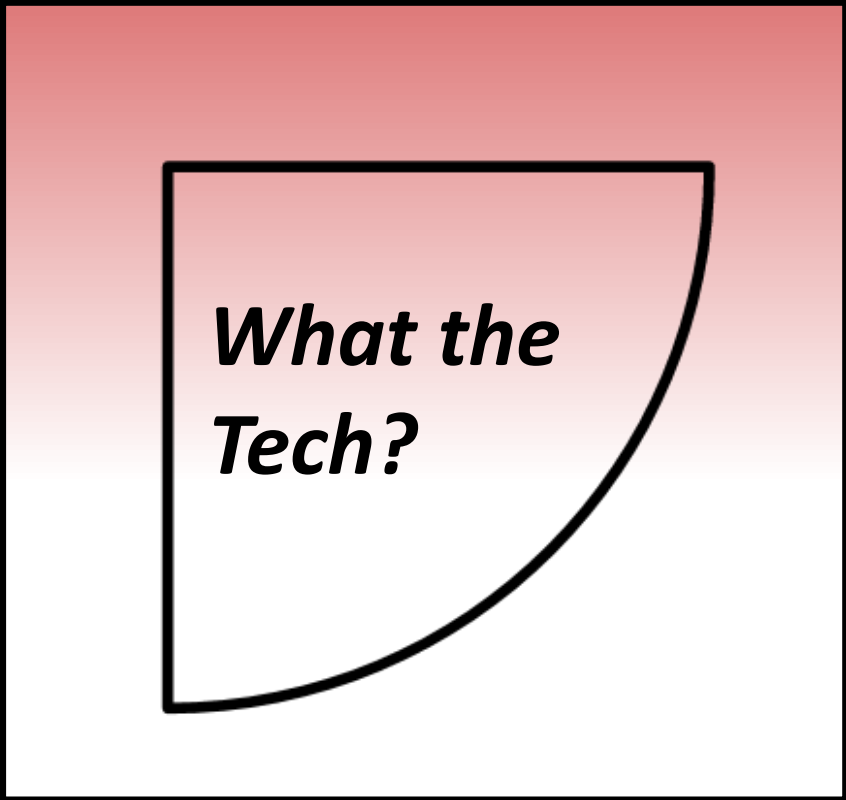


Questions so far?

Next: Popping the Hood on AI



AI: Popping the Hood



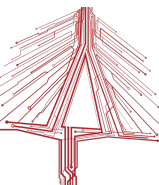
*What the
Tech?*

- Computers learn a lot like humans
- But how do we learn?
 - By example (more or less)

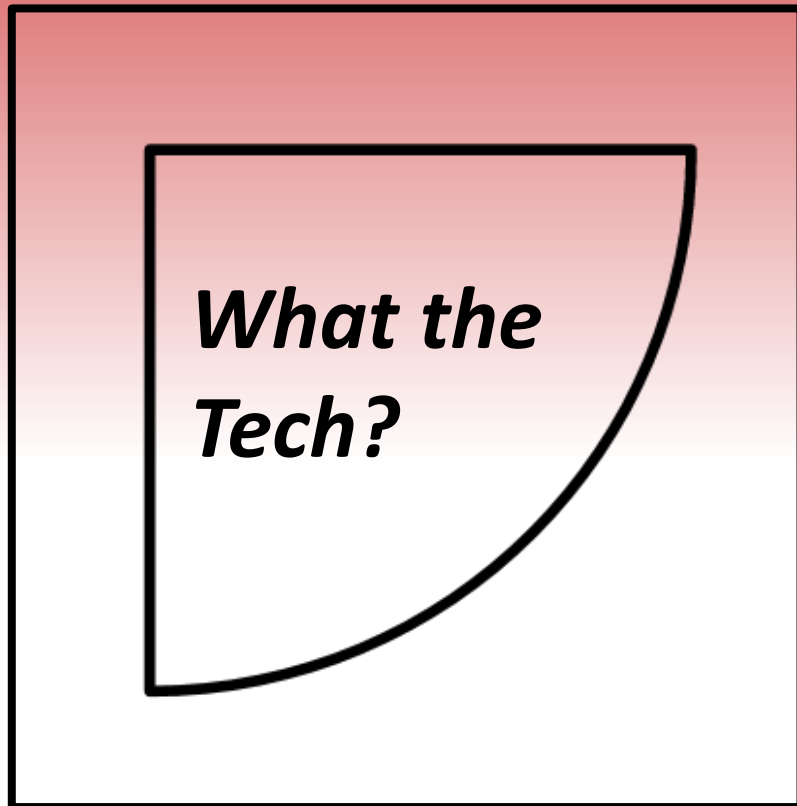


“Learning by example is one of the most powerful and mysterious forces driving intelligence, whether you’re talking about humans or machines. Think, for instance, of how children first learn to recognize letters of the alphabet or different animals. You simply have to show them enough examples of the letter B or a cat and before long, they can identify any instance of that letter or animal. The basic theory is that the brain is a trend-finding machine.”

*-Associate Professor Samir Rawashdeh,
University of Michigan –Dearborn*



AI: Popping the Hood



Some Key Terms We'll Discuss

- Inputs
- Algorithms
- Prompts
- Outputs
- Machine learning
- Deep learning



Input
Information / “Training
Data”

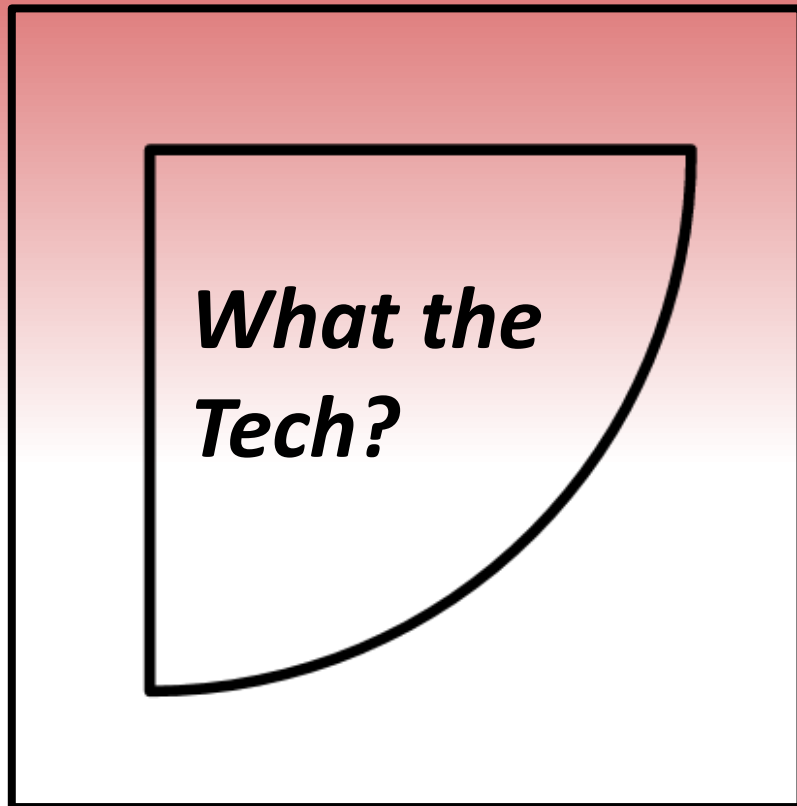


Input is fed into
the computer

Algorithms
Based on patterns the
computer (machine)
learned from the input



AI: Popping the Hood



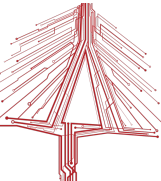
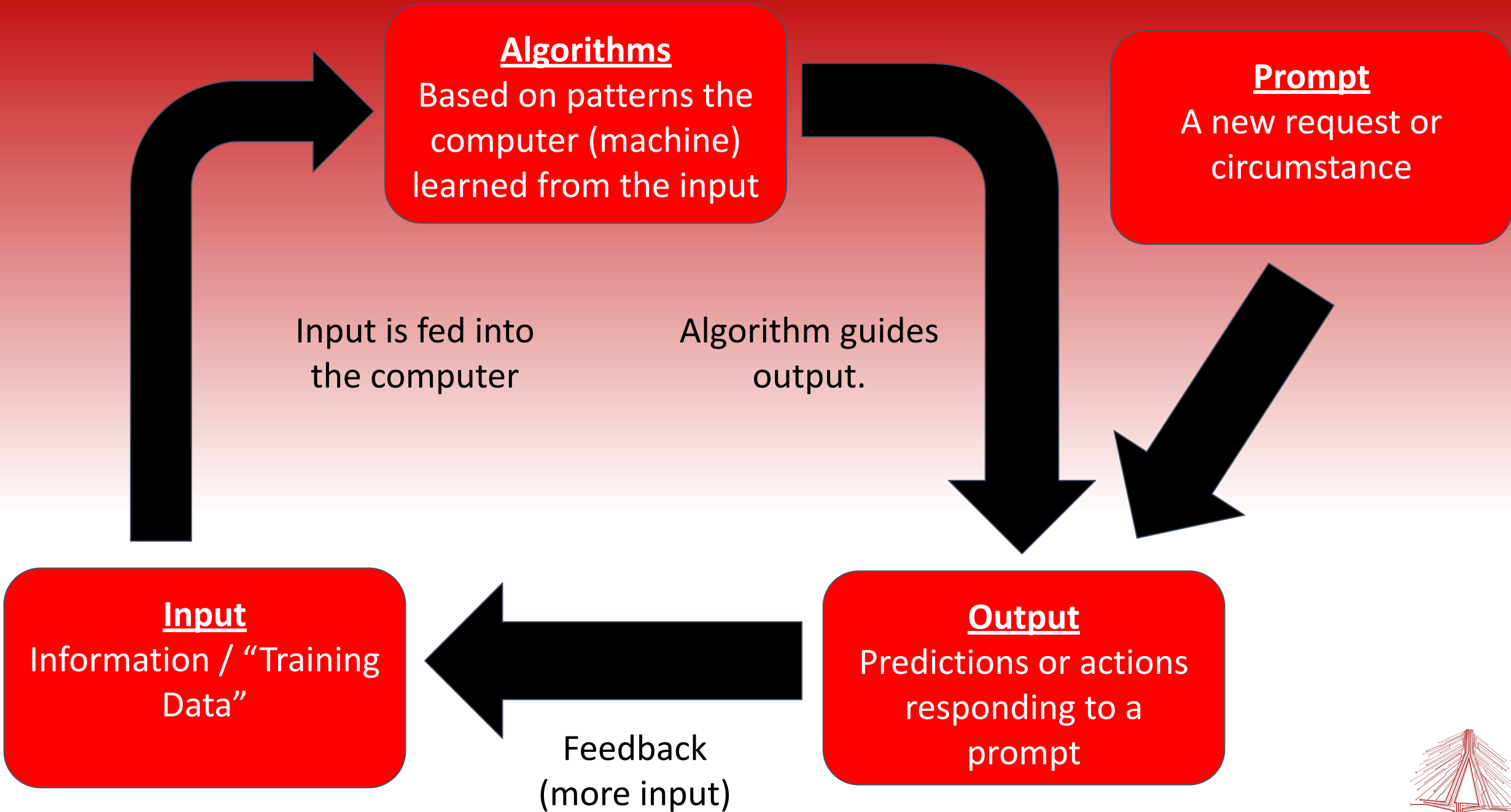
WHAT IS AN ALGORITHM?

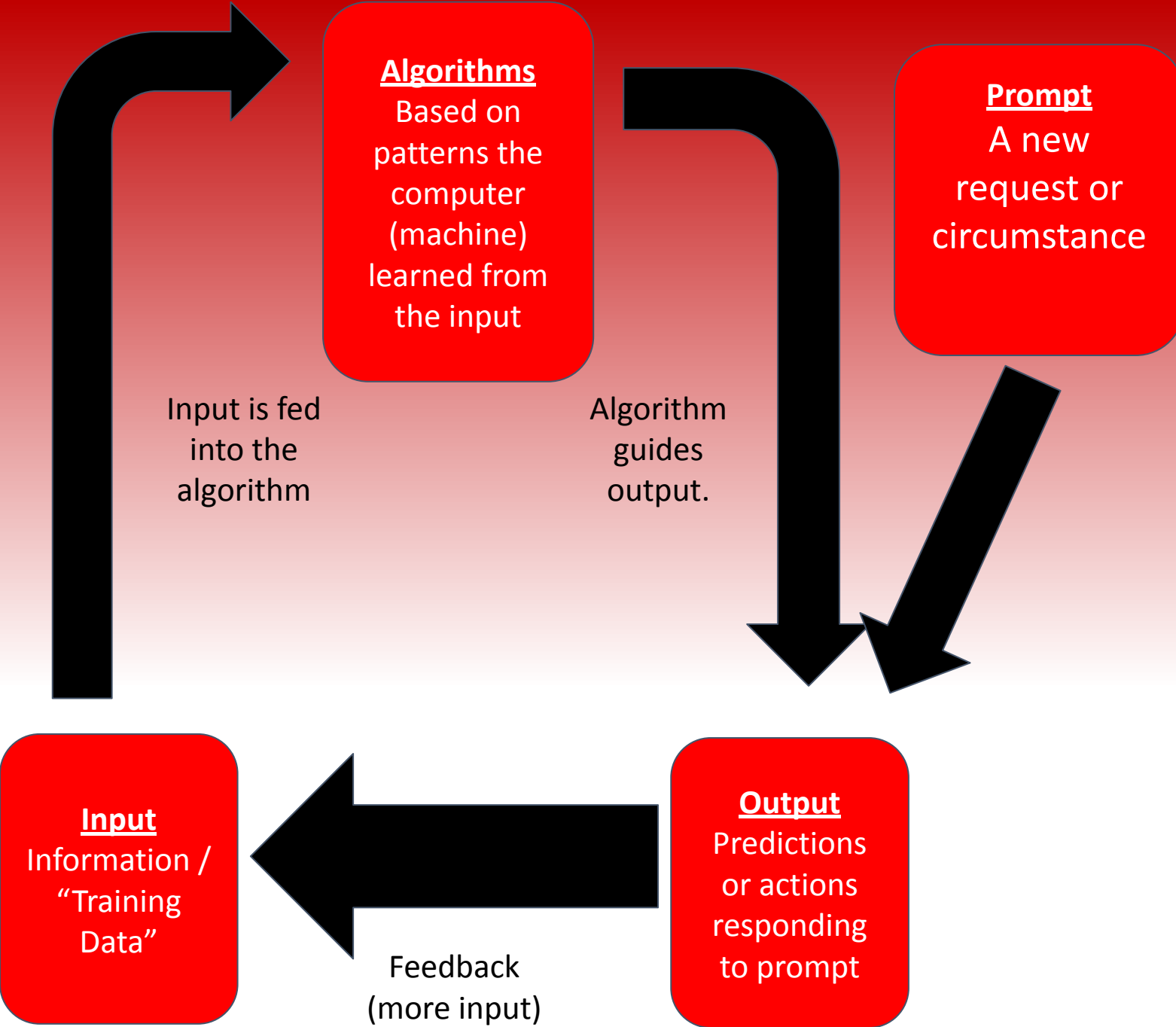
“A process, whether a set of instructions or calculation, that computers follow to solve a problem.”

Where do you hear about algorithms most often?

You could argue that humans operate on algorithms too: decision-making toward a preferred outcome based on the available facts.







How AI Works

- This is a self-sustaining cycle.
- The AI is not just trained to do a task in a single way
 - It learns how to do the task better or how to expand to other tasks with every request!



Questions so far?

Next: A Closer Look at Algorithms





NETFLIX



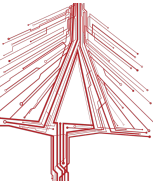
A CLOSER LOOK AT ALGORITHMS

We have our definition:

“A process, whether a set of instructions or calculation, that computers follow to solve a problem.”

But what does that process look like in action?





EXAMPLE: SPOTIFY



“Our algorithms consider trends and the general tastes and behaviors of users to improve recommendations for everyone. When users take similar actions on certain content, our algorithms have more information about how people might want to interact with it.”

- *“Example: If many users interact with a specific search result (e.g. a song or a podcast), we are likely to recommend that result to other users who search for similar things.”*

-Spotify’s website





Input
Many songs,
albums,
podcasts,
marked by
user
feedback

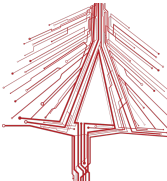


Ratings
(more input)

Output
The new
album by a
popular
artist

Algorithms
-For the user Mr.
Jones, what are
the features that
make a good
song?
-What genres does
Mr. Jones lean
towards?

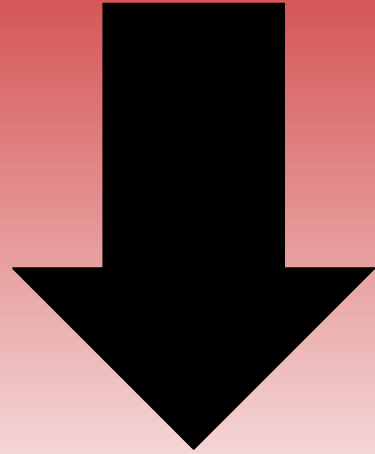
Prompt
Ask for a great
album! A bad
one!



“NO INPUT, NO OUTPUT.”

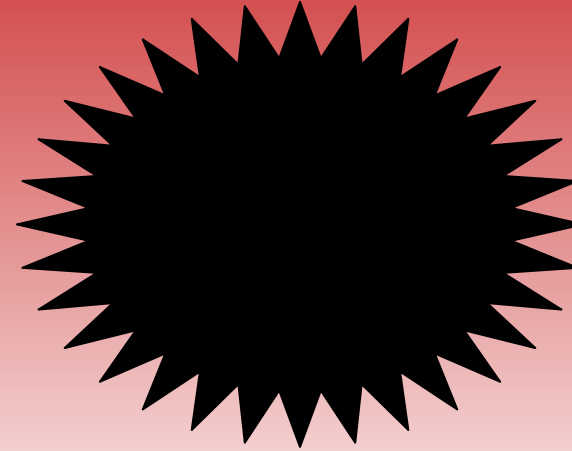


HOW AI WORKS



INPUT

- The information from which we want to learn how the world works
 - Also known as “training data”

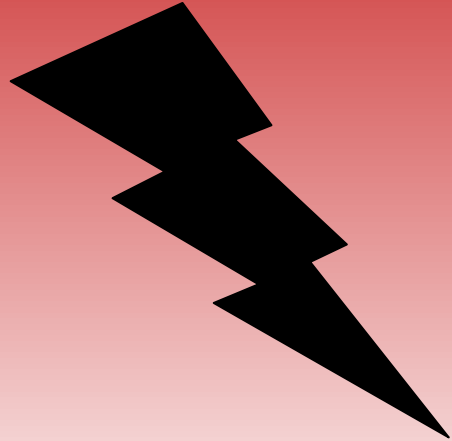


ALGORITHMS

- The algorithm is learned from the training data
- Different types of AI learn algorithms in different ways (more on this later)

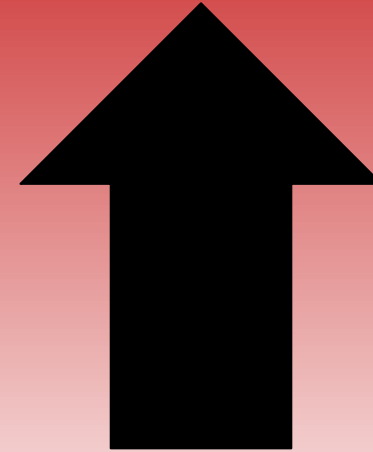


HOW AI WORKS



PROMPT

- A new request or circumstance
- May require repeated tweaking to make our desired output what we wish.



OUTPUT

- Output depends on how the algorithm responds to the prompt received
- Beware: outputs are only as reliable as the training data they are learned from.



Questions so far?

Break Time

Next: Chat GPT Activity



Chat GPT Activity

The Elements of the “AI Cycle”

- Input
- Algorithm
- Output
- Prompt

Let’s See Them in Action!



ChatGPT



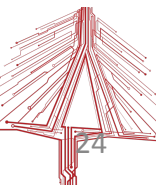
Chat GPT Activity



ChatGPT

Who has used ChatGPT before?

- What did you use it for?
- Did you get the answer you expected?

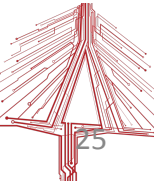


Chat GPT Activity



ChatGPT

- 1) Go to chat.openai.com
- 2) You should get an empty chat window with a text box at the bottom
- 3) Don't click "Log in" or Sign up"
- 4) Don't ask any questions yet: the free trial of ChatGPT only allows you a certain amount of questions in a given amount of time
 - a) But ChatGPT doesn't say how much...



Chat GPT Activity



You

How many free trial requests does one get with ChatGPT 3.5?



ChatGPT

As of my last update, OpenAI typically offers a limited number of free trial requests for ChatGPT 3.5. However, the specifics may vary based on OpenAI's current policies, so it's best to check directly with OpenAI's website or contact their support for the most accurate and up-to-date information regarding free trial requests.



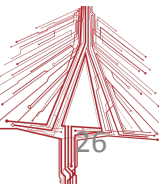
You

Why can't you be specific?



ChatGPT

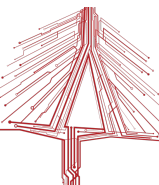
I apologize for any inconvenience caused. The reason I can't provide a specific number is that OpenAI's policies regarding free trial requests, including the number of requests allowed, can change over time. To ensure accuracy, it's always best to refer to the latest information provided by OpenAI themselves.



Chat GPT Activity



- Even now we see the limits and *opacity* of AI
- Google searching suggests the limit is 10 to 20 requests an hour... which is less than you think.
 - How many questions do we ask each other in an hour?



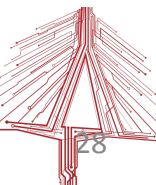
Chat GPT Activity



ChatGPT

Write this **exact** prompt:

“Describe _____ in twenty sentences.”



Chat GPT Activity



ChatGPT

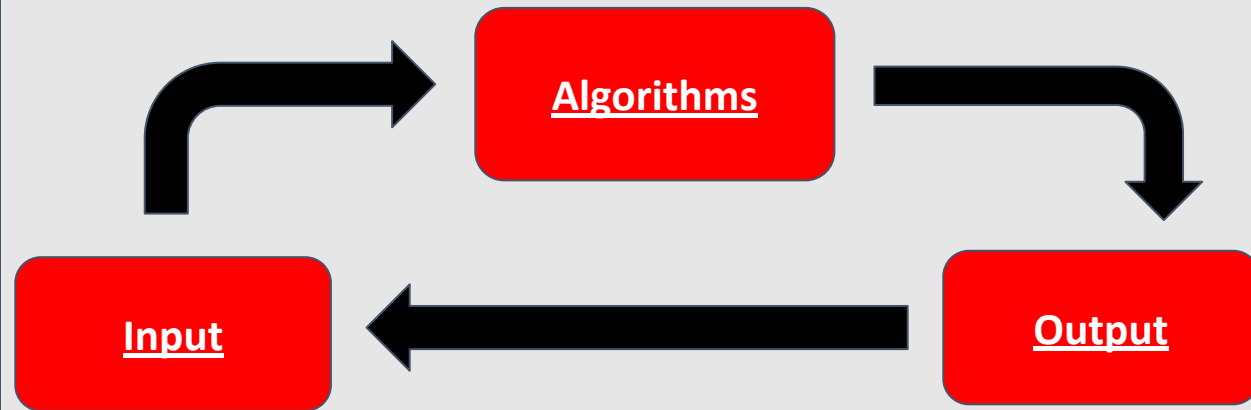
- Let's make the request more specific.
- What if "twenty sentences" isn't what we want?



Limitations of ChatGPT

Strengths of ChatGPT

Prompt Engineering (or How to Get What You Want from Chat GPT)



Limitations of ChatGPT (and Generative AI)

- Algorithms are very literal.
- Knowledge is limited by the information that ChatGPT has been “taught.”

Strengths of ChatGPT

- It can learn.
- It is tireless and flexible.
- It is capable of imitating many styles.

Prompt Engineering (or How to Get What You Want from Chat GPT)

- Be specific about what you want.
- Fact check!

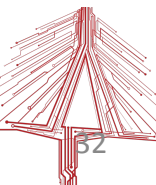
- Refine through multiple steps.
- Ask for multiple versions.
- Determine the most useful format.

Chat GPT Activity



ChatGPT

Let's do it again for something you are **not** an expert in.

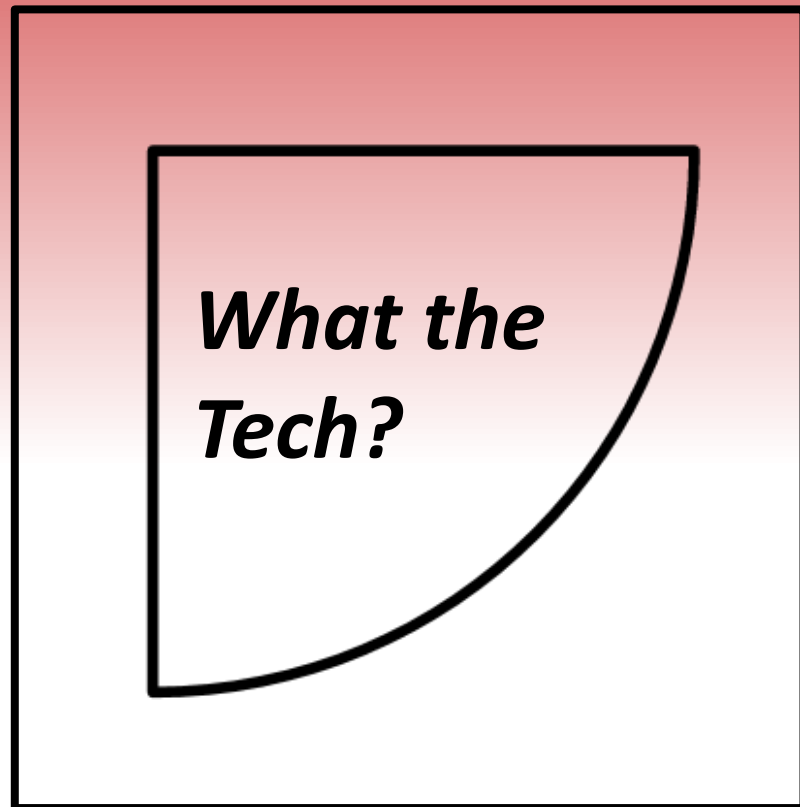


Questions so far?

Next: The “Layers” of AI



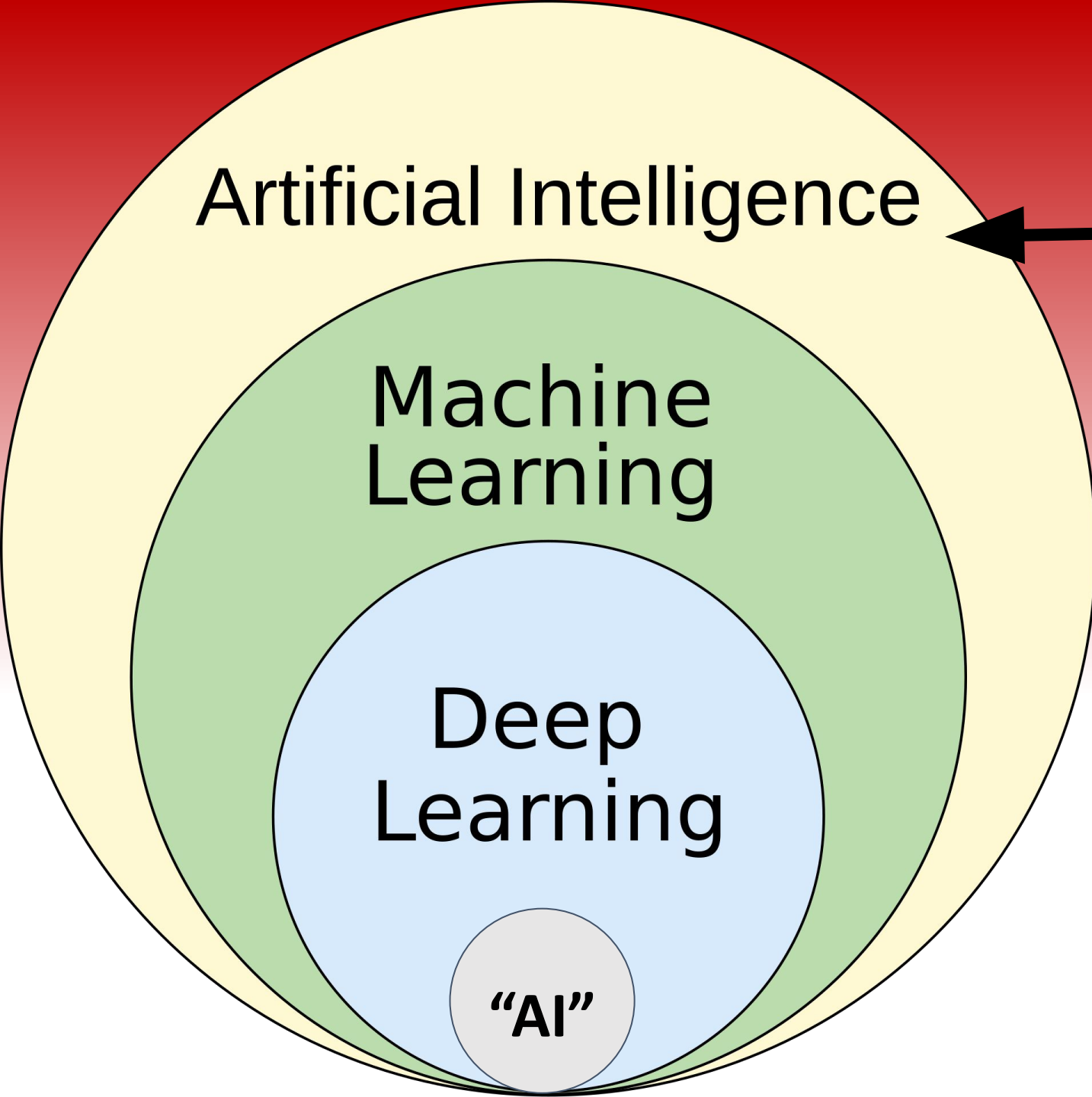
How AI Works



The “Layers of AI”

- Artificial Intelligence
 - The original definition
- Machine Learning
- Deep Learning
- “AI”
 - Our modern definition

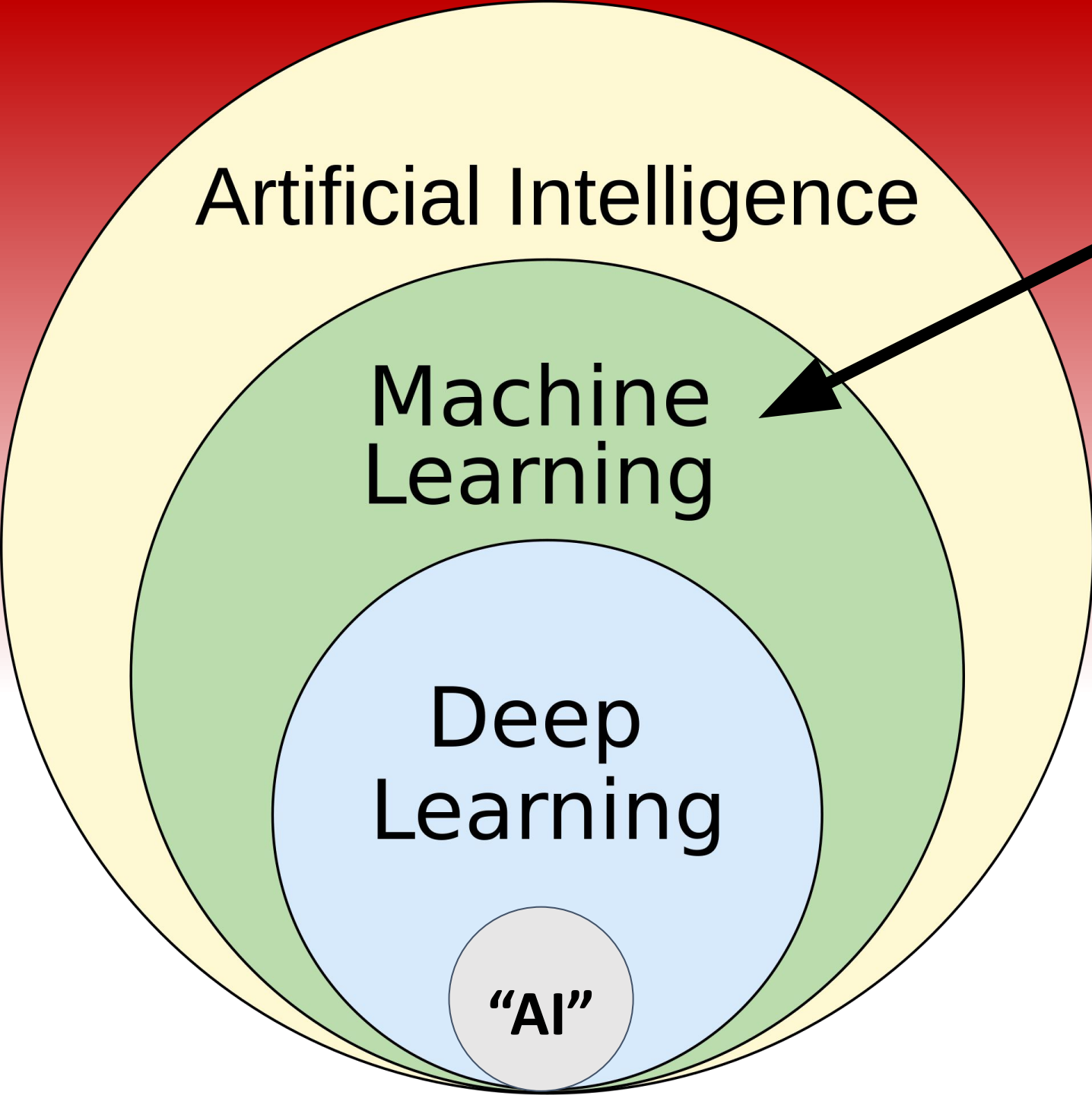




Artificial Intelligence (original definition):

- “Any way that computers perform tasks usually requiring human intelligence.”
 - This is outdated.
- Modern definition is tighter (“AI”)

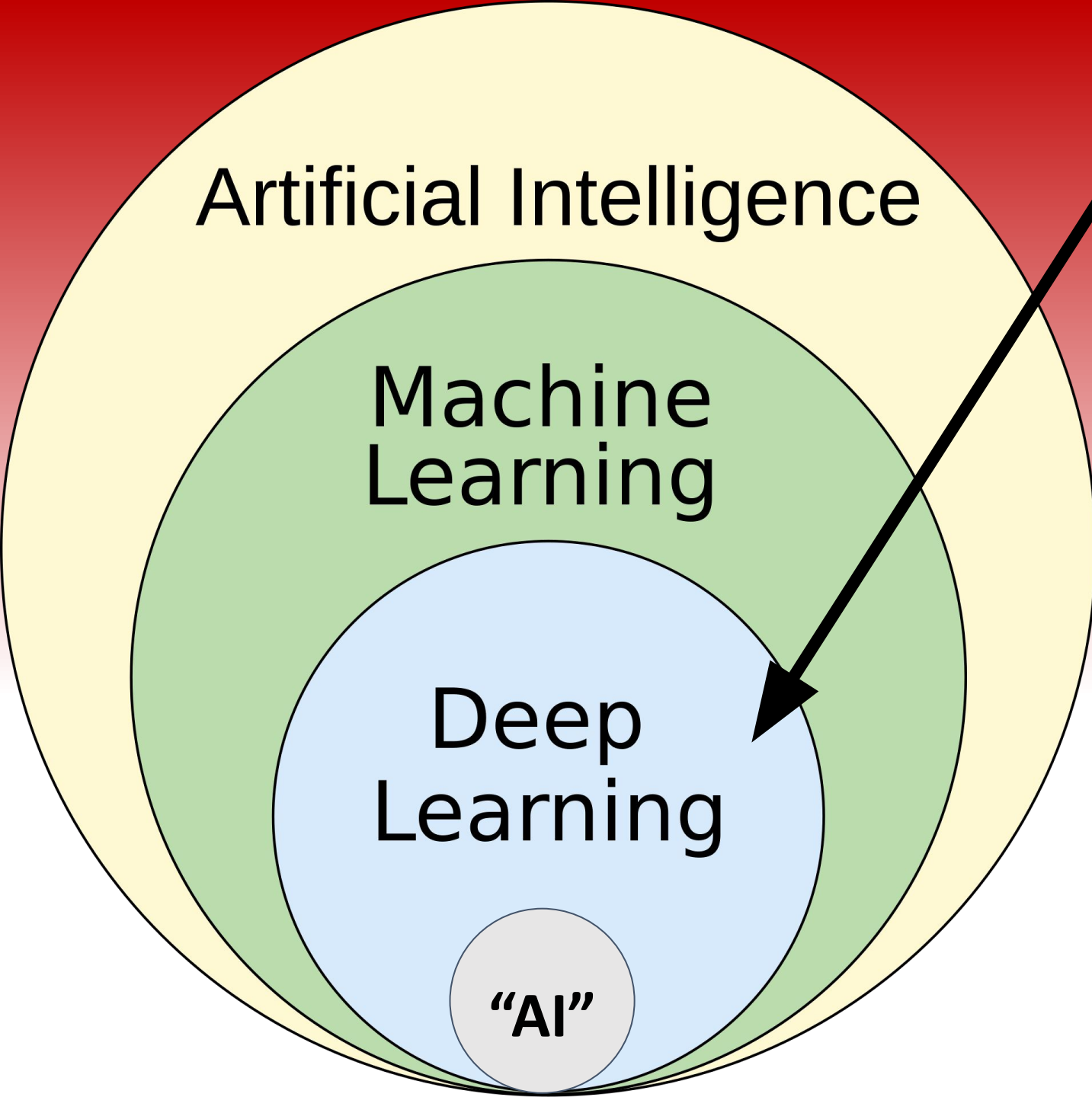




Machine Learning:

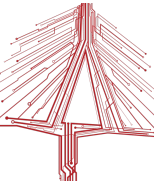
- When an algorithm generates a model using training data with examples of correct decisions.
- Algorithm uses the model it produced in training to make predictions from new data.
 - This is what we mean when we say “the algorithm recommended X”

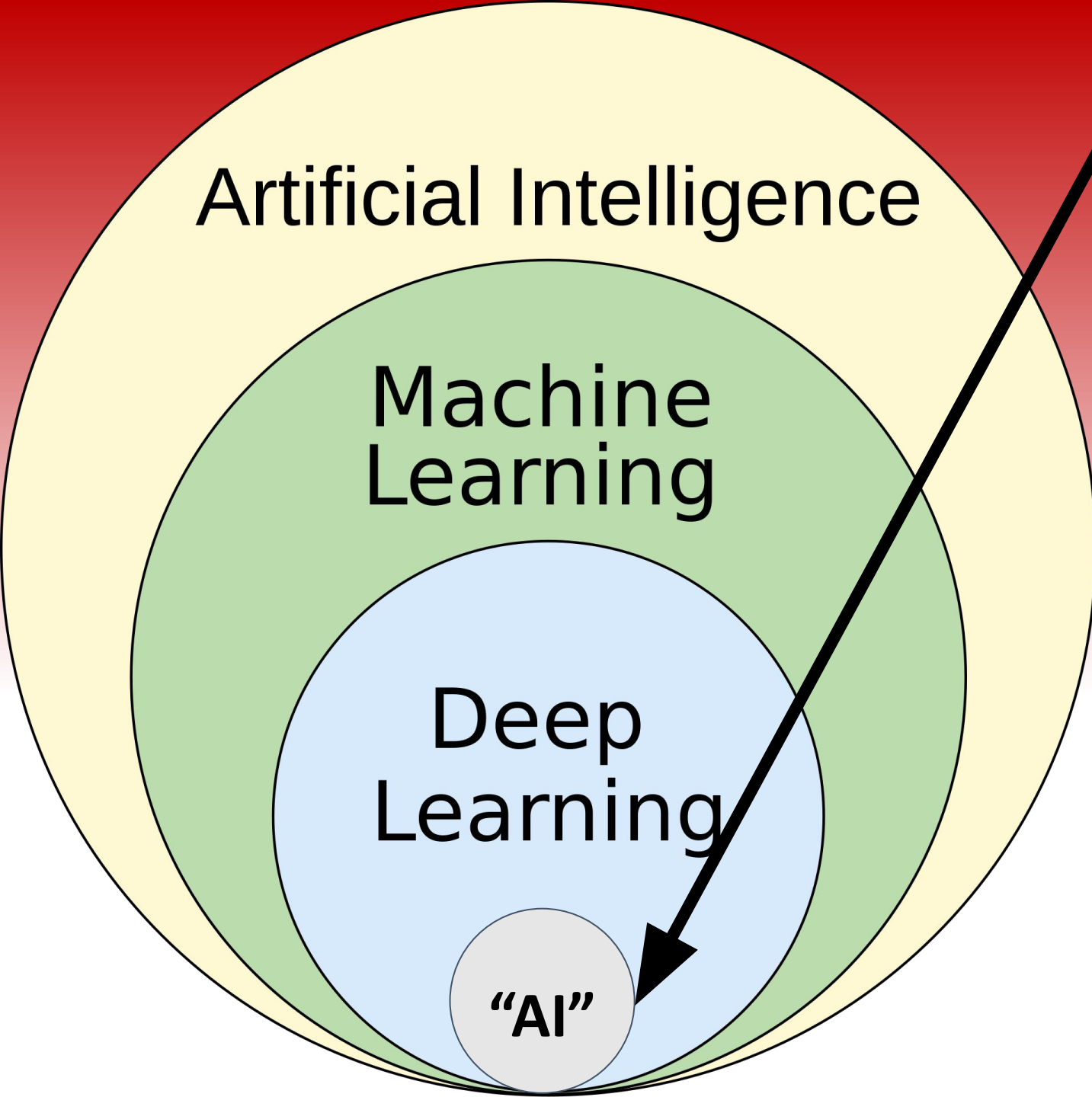




Deep Learning

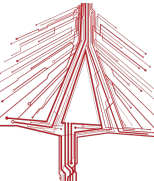
- A subset of machine learning that can “self train”
 - Instead of being told what to do by humans.
 - This can be the “scariest” issue of AI

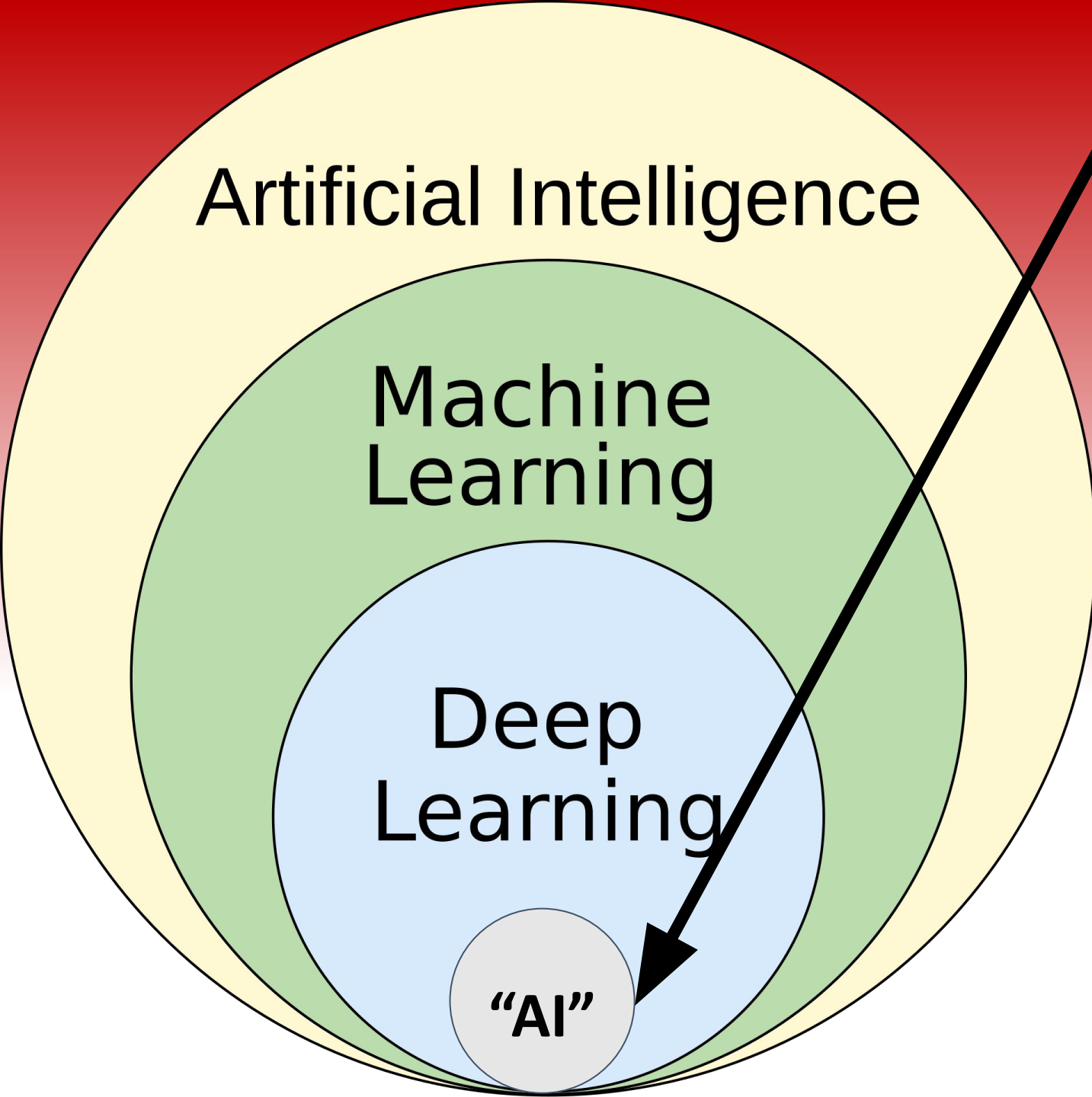




“AI”

- When people say “AI,” they can mean many things at once
- Modern definition includes DL, ML, and the original definition

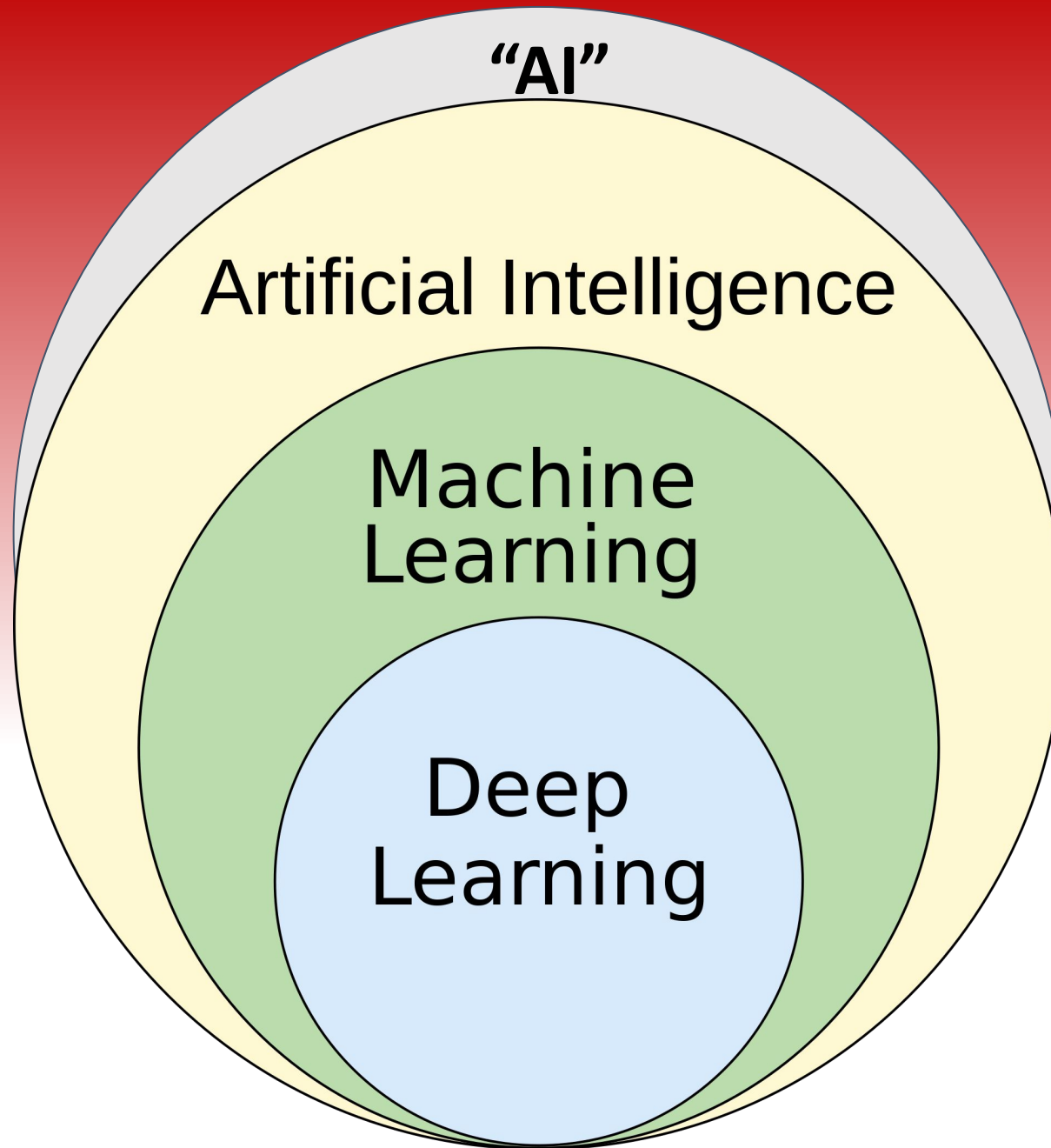




“AI”

- “AI”: a specific type of system that is capable of continuous learning.
 - Done through the gathering, analysis, and undertakings based on data.



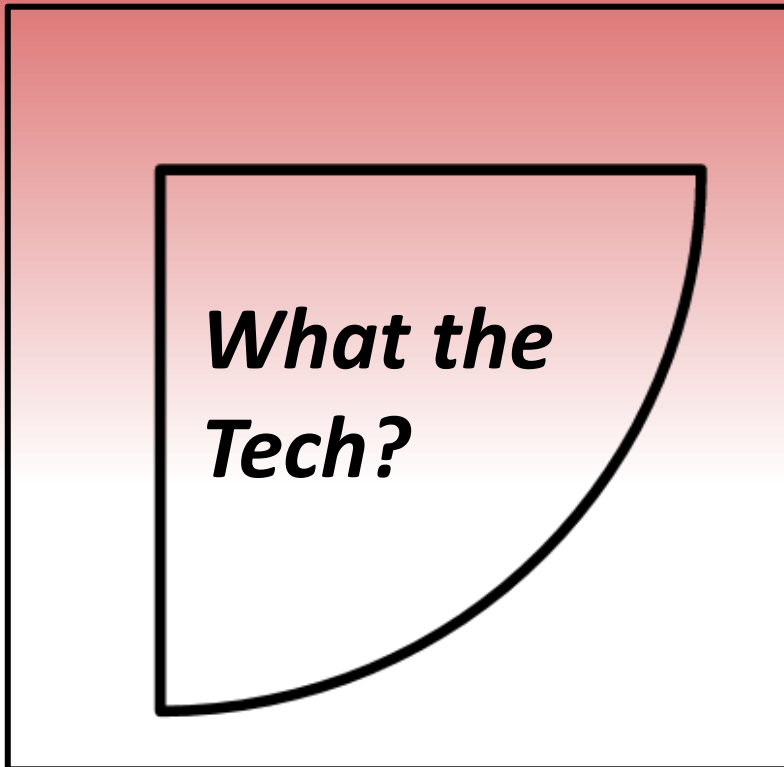


Questions so far?

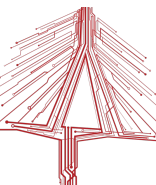
Next: AI and Tech on the Street



Next Time:



- Activity: Tech in the world.
 - What tech on campus makes a difference?
 - How do you think AI could be involved?
- Debrief



Tech in the World

- Before next time...
 - Let's watch some of these short videos from the City of Boston
 - There are some that collect data that would be useful in AI...

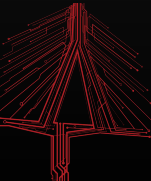
What the Tech?
City of Boston
9 videos 778 views Last updated on Jun 5, 2023

▶ Play all 🔀 Shuffle

- 1 **What The Tech: Episode 1 - Photocells**
City of Boston • 1K views • 2 years ago
1:56
- 2 **What the Tech: Episode 2 (Bike Counters)**
City of Boston • 689 views • 2 years ago
2:21
- 3 **What The Tech Ep.3: DAS Antennas**
City of Boston • 416 views • 2 years ago
2:16
- 4 **What The Tech: Episode 4 - Numina Traffic Sen**
City of Boston • 752 views • 2 years ago
2:17
- 5 **What the Tech: Episode 5- Crosswalk Buttons**
City of Boston • 616 views • 2 years ago
2:39
- 6 **What The Tech Episode 6: The Fire Alarm Box**
City of Boston • 3.2K views • 1 year ago
3:08
- 7 **What The Tech: Episode 7 - Air Quality Sensors**



Halfway Point

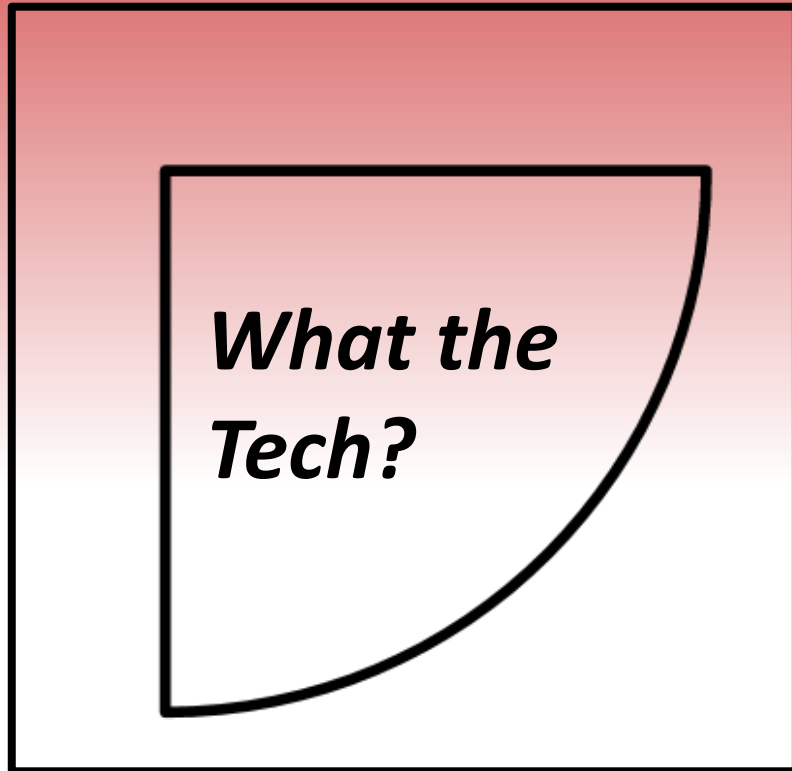


What the Tech?

AI and Tech on the Street



AI and Tech on Campus



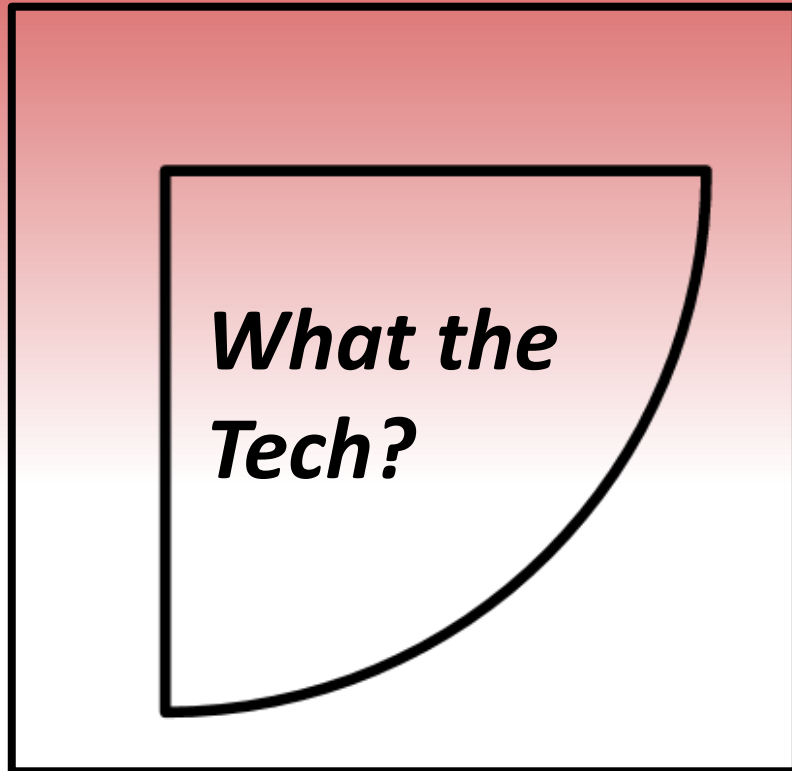
Previously, we...

- Shared our weekly reflections
- Looked at key terms
- Saw how AI actually works (activity)

- Any questions? Refreshers?



AI and Tech on Campus



Today, we will...

- Tech in the world: what tech on the street makes a difference?
 - We already discussed the overlap of tech and AI in our phones and computers.

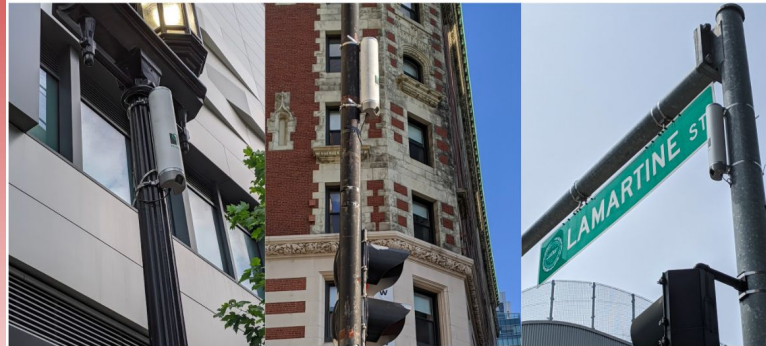


AI and Tech on Campus: Some Examples



Security Cameras

- Collects images
- Footage discarded
- No facial recognition software - banned in Boston in 2020
 - Allowed in most of Massachusetts



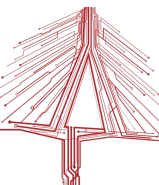
Numina™ Traffic Sensors

- Collects size and frequency data
 - Privacy-oriented
- Not a camera
- Senses sizes of shapes
- What The Tech, Ep. 4



DAS Antennas

- “Distributed Antenna Systems”
- Sends (distributes) cell or internet service across area
 - *Starting point for automated cars?!*



AI and Tech Outside Campus: Some Examples



Bike sensors

- Small, low-res cameras
- Counts bikes at end of day
- Used by city planners
- Sixty as of 2017
- Ep. 2: What The Tech?



ShotSpotter™

- Used by BPD
- Based on noise, calculates coordinates and informs police
- Concerns on accuracy and placement
- [Leaked map \(Wired, Feb. 2024\)](#)



Questions so far?

Next: Tech on the Street Activity



AI and Tech on Campus

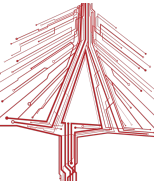
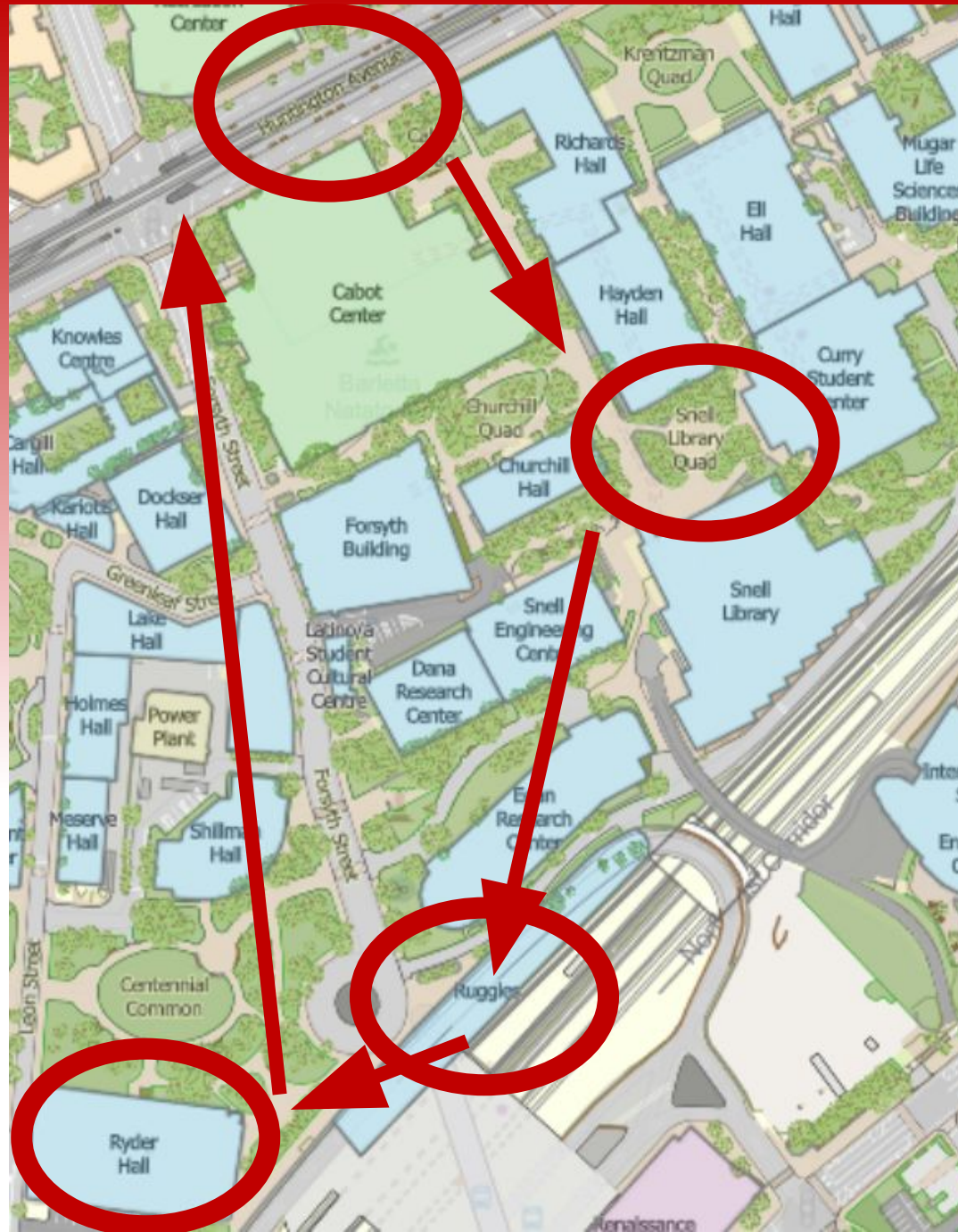
***What the
Tech?***

- Groups of 2 or 3
- One clipboard each
- Don't just look for *these* examples. Be creative!
 - If you're not sure... make the argument!
- Three stops: [INSERT HERE]



Use map of your choosing. This is just an example.

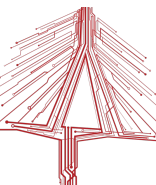
Remember to hand out accompanying worksheet



AI and Tech on Campus

***What the
Tech?***

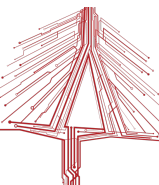
- Debrief!
- A chance for you to tell us how it's going. For instance:
 - What went well this week?
 - What didn't?
 - What are you excited for?
 - What are you unsure about?



Part 2 Reflection Assignments

- 1) What are some of the advantages to have an algorithm built around your music/movie/TV tastes? Disadvantages? Is there something you wish you could change? If so, what?
- 2) What was something interesting you learned during this week's activities and how is it relevant to one of the communities you identified at the beginning of the week?

Please answer both questions



END OF CONTENT

