1. Lecture quiz

Due Sep 21 at 4:17pm **Points** 2 **Questions** 2
Available after Sep 21 at 4pm **Time Limit** 5 Minutes

Instructions

You have 5 minutes to complete this quiz.

It also acts as a catalog, so if you don't take it, it will mean that you skipped class. 0 point is also a valid proof of attendance.

Attempt History

	Attempt	Time	Score
LATEST	Attempt 1	2 minutes	1.2 out of 2

Score for this quiz: **1.2** out of 2
Submitted Sep 21 at 4:14pm
This attempt took 2 minutes.

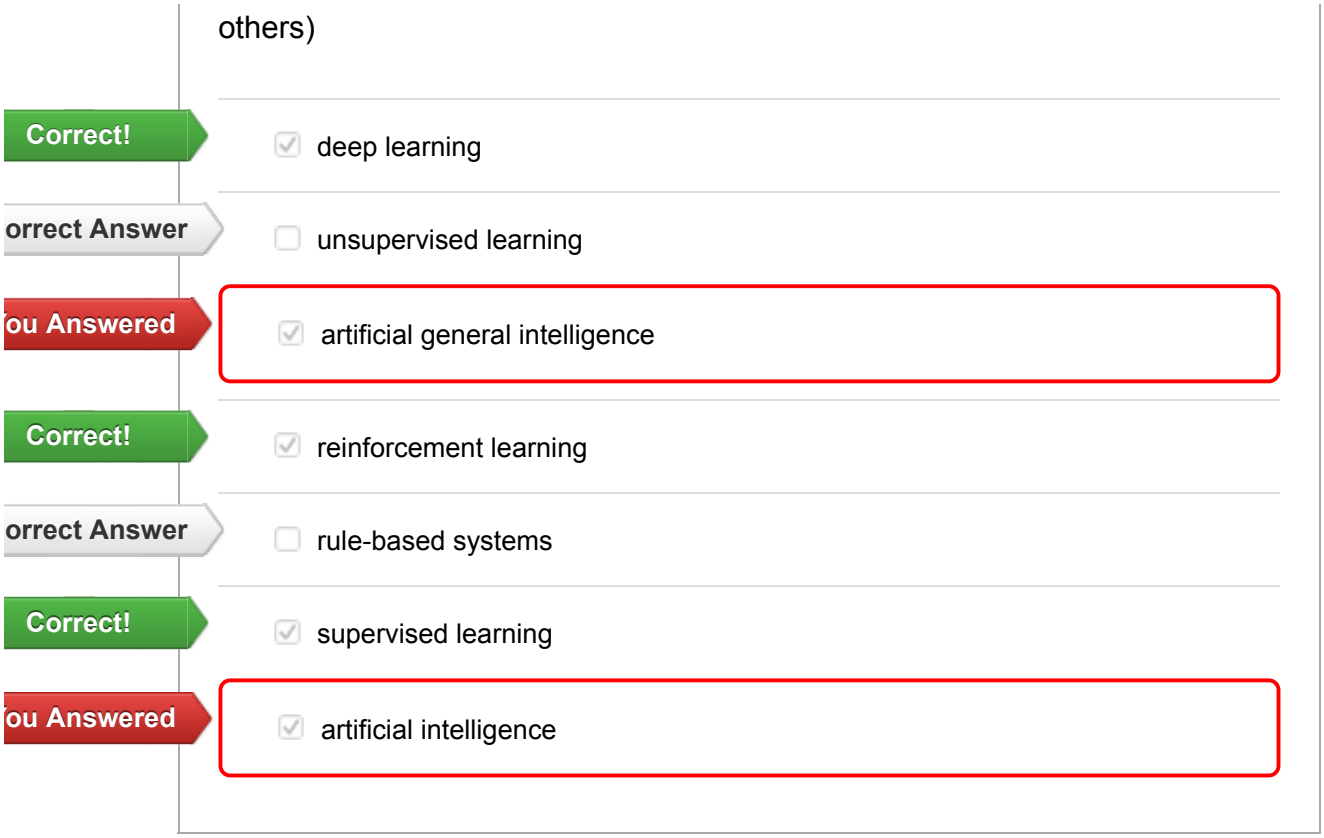
Question 1 — 1 / 1 pts

AI's performance (today) is subhuman because

- it can't deal with high-dimensional inputs
- Correct! it can be fooled by low-amplitude noise
- it can't combine old-fashioned AI and deep learning

Question 2 — 0.2 / 1 pts

Machine learning includes the following algorithmic components (among



Quiz Score: **1.2** out of 2

2. Lecture quiz

Due Sep 28 at 5:30pm **Points** 2 **Questions** 2 **Time Limit** 5 Minutes

Instructions

You have 5 minutes to complete this quiz.

It also acts as a catalog, so if you don't take it, it will mean that you skipped class. 0 point is also a valid proof of attendance.

Attempt History

	Attempt	Time	Score
LATEST	Attempt 1	4 minutes	2 out of 2

Score for this quiz: **2** out of 2
Submitted Sep 28 at 5:30pm
This attempt took 4 minutes.

Question 1

1 / 1 pts

- If X is a discrete stochastic variable that can take values {x1, x2, ...xn} with probabilities p(x1), ...p(xn), respectively, then what is the expected value of X?

p(xn)*xn

Correct!

Sum(p(xi)*xi) for every i

Prod(p(xi)+xi) for every i

Sum(p(xi)/xi) for every i

Question 2

1 / 1 pts

- Let the weights of a neuron be $w \in R^n$ (w is element of R^n) the input, $x \in R^n$ (x is element of R^n) and the threshold $b \in R$ (b is element of R). What is the output of the neuron (y)?

I don't know.

y = wT*x +b

y = w*x -b

Correct!

y = w^T*x -b

Quiz Score: **2** out of 2

3. Lecture quiz

Due Oct 5 at 4:15pm **Points** 2 **Questions** 2 **Available** after Oct 5 at 4pm
Time Limit 5 Minutes

Instructions

You have 5 minutes to complete this quiz.

It also acts as a catalog, so if you don't take it, it will mean that you skipped class. 0 point is also a valid proof of attendance.

Attempt History

	Attempt	Time	Score
LATEST	Attempt 1	3 minutes	0.5 out of 2

Score for this quiz: **0.5** out of 2
Submitted Oct 18 at 2:32pm
This attempt took 3 minutes.

Question 1 — 0.5 / 1 pts

What makes possible to transfer the scientific discoveries of 20000 years in 20 years to a child? (multiple answers)

Correct! ☑ Component learning

Correct! ☑ Linear proofs of combinatorial problems

☐ The evolution of the human brain in the last 100 years.

ou Answered ☑ Improvement in teaching methods.

Question 2

0 / 1 pts

What is the difference between creativity and intelligence?

orrect Answer

- Creativity is the formation of new concepts; intelligence is the cognitive manipulation of the concepts.
- They are practically the same.
- Intelligence is about to create new concepts; creativity is the manipulation of the concept.

ou Answered

- Creativity is only used in human sciences, while intelligence is used in natural sciences.

Quiz Score: **0.5** out of 2

4. Lecture quiz

Due Oct 13 at 8pm **Points** 2 **Questions** 2 **Time Limit** 5 Minutes

Instructions

You have 5 minutes to complete this quiz.

It also acts as a catalog, so if you don't take it, it will mean that you skipped class. 0 point is also a valid proof of attendance.

Attempt History

	Attempt	Time	Score
LATEST	Attempt 1	1 minute	2 out of 2

Score for this quiz: **2** out of 2
Submitted Oct 13 at 7:39pm
This attempt took 1 minute.

Question 1 — 1 / 1 pts

The size of the representation of a sparse autoencoder "THIS IS YOUR ANSWER" as/than the dimension of the input.

- the same
- Correct! Larger
- smaller
- is either larger, smaller or the same

Question 2 — 1 / 1 pts

What does the Chinese Room example state?

- Lookup tables can make sense of the representation
- Feedforward processing can make sense of the representation
- Feedforward processing can not make sense of the representation

Correct!

- The homunculus cannot make sense of the representation

Quiz Score: **2** out of 2

6. Lecture quiz

Due Oct 26 at 11:59pm **Points** 2 **Questions** 2
Available Oct 26 at 7pm - Oct 26 at 11:59pm about 5 hours **Time Limit** 5 Minutes

Instructions

You have 5 minutes to complete this quiz.

It also acts as a catalog, so if you don't take it, it will mean that you skipped class. 0 point is also a valid proof of attendance.

This quiz was locked Oct 26 at 11:59pm.

Attempt History

	Attempt	Time	Score
LATEST	Attempt 1	less than 1 minute	2 out of 2

Score for this quiz: **2** out of 2
Submitted Oct 26 at 9:31pm
This attempt took less than 1 minute.

Question 1 — 1 / 1 pts

The Markov assumption means that:

- the optimal strategy can be stochastic
- The transition probability matrix is a function of the decision series
- Reward is a function of the transition probability matrix
- Correct! past does not count in the decision making process

Question 2

1 / 1 pts

What is the 'reward' in Reinforcement Learning (Goal-Oriented System)?

Correct!

- (•) a real number
- ( ) a real vector
- ( ) a nonnegative real number
- ( ) a nonnegative real vector

Quiz Score: **2** out of 2

7. Lecture quiz

Due Nov 2 at 4:11pm **Points** 2 **Questions** 2
Available until Nov 2 at 4:53pm **Time Limit** 5 Minutes

Instructions

You have 5 minutes to complete this quiz.

It also acts as a catalog, so if you don't take it, it will mean that you skipped class. 0 point is also a valid proof of attendance.

This quiz was locked Nov 2 at 4:53pm.

Attempt History

	Attempt	Time	Score
LATEST	Attempt 1	3 minutes	2 out of 2

Score for this quiz: **2** out of 2
Submitted Nov 2 at 4:28pm
This attempt took 3 minutes.

Question 1 — 1 / 1 pts

Which nonlinearity can produce outputs larger than 1?

- Sigmoid
- Tanh
- I don't know.
- ReLU — Correct!

Question 2

1 / 1 pts

What does a pooling layer do?

- It performs maximum operation
- Correct! It can perform either maximum or averaging operation among other things
- It performs averaging
- It does maximum and averaging operations

Quiz Score: **2** out of 2

8. Lecture quiz

Due Nov 9 at 5:30pm **Points** 2 **Questions** 2
Available until Nov 9 at 5:30pm **Time Limit** 5 Minutes

Instructions

You have 5 minutes to complete this quiz.

It also acts as a catalog, so if you don't take it, it will mean that you skipped class. 0 point is also a valid proof of attendance.

This quiz was locked Nov 9 at 5:30pm.

Attempt History

	Attempt	Time	Score
LATEST	Attempt 1	3 minutes	0.67 out of 2

Score for this quiz: **0.67** out of 2
Submitted Nov 9 at 5:30pm
This attempt took 3 minutes.

Question 1

0.67 / 1 pts

Which of the following is/are classical dimensionality reduction method(s)?

Correct! ☑ PCA

☐ CCP

Correct! ☑ MDS

☐ RT-PCR

orrect Answer ☐ LLE

Question 2

0 / 1 pts

Why do we need low-dimensional embedding and/or distance preservation and/or noise filtering? (multiple answers)

orrect Answer

- [ ] to be able to learn to control faster we need low dimensional embedding, distance preservation, and noise filtering

ou Answered

- [x] for improving the smoothness of temporal changes we need distance preservation

ou Answered

- [x] to ease object recognition in deep learning

Correct!

- [x] for enabling reinforcement learning , because it scales exponentially with the number of variables

Correct!

- [x] to overcome combinatorial explosion we need low-dimensional embedding

Quiz Score: **0.67** out of 2

Midterm

Due Oct 19 at 4:40pm **Points** 18 **Questions** 18
Available Oct 19 at 4:07pm - Oct 19 at 4:40pm 33 minutes **Time Limit** 25 Minutes

Instructions

During the quiz completion, we will automatically monitor if they leave the Canvas site.
Anyone who is found to change window/page during the quiz will have their quiz invalidated.
A short time will be allowed for the midterm, 25 minutes. This should be more than enough time to complete the series of questions, but if we see that this fails en masse, the scores will be corrected.
You will see one question at a time, and once answered, the questions will be locked.
The results and solutions will be made public after the midterm is solved.
Since the midterm will be very short, you cannot leave the room until the end. If you have to leave the room your exam is over.

This quiz was locked Oct 19 at 4:40pm.

Attempt History

	Attempt	Time	Score
LATEST	Attempt 1	18 minutes	9 out of 18

Score for this quiz: **9** out of 18
Submitted Oct 19 at 4:32pm
This attempt took 18 minutes.

Question 1 — 1 / 1 pts

What is the curse of dimensionality?

Correct!

- (•) search space increases exponentially with the number of dimensions
- ( ) the dimension of the search space decreases with the number of variables
- ( )

in a bounded world, the volume of a sphere of radius 1 increases with the number of dimensions

the larger the dimension of the problem, the larger the number of dependent variables

Question 2

1 / 1 pts

General Intelligence is the capability to "THIS IS YOUR ANSWER"

approximate a function

maximize reward

solve a fixed set of problems

Correct!

solve arbitrary new problems

Question 3

1 / 1 pts

What is the autoencoder-based resolution of the homunculus fallacy?

The homunculus is immaterial

The decoded input makes sense of the input by representing it

The input makes sense of the representation by decoding it

Correct!

The representation makes sense of the input by reconstructing it

Question 4

0 / 1 pts

What is the starting point of the homunculus fallacy?

- making sense is internal to the brain
- ou Answered representation should make sense
- orrect Answer somebody should make sense of the representation
- making sense is possible

Question 5

0 / 1 pts

Which of the following is NOT part of a Reinforcement Learning (Goal-Oriented System) setting?

- ou Answered environment
- orrect Answer target variable
- model
- strategy

Question 6

0 / 1 pts

What is the explanation of the Necker cube illusion?

- there are delays in action processing

orrect Answer
- only one interpretation is available for consciousness at a time

ou Answered
- there are delays in sensory processing

- there are delays in sensory and in action processing

Question 7

1 / 1 pts

The size of the representation of a sparse autoencoder "THIS IS YOUR ANSWER" as/than the dimension of the input.

- the same
- smaller

Correct!
- typically larger

- is either larger, smaller or the same

Question 8

0 / 1 pts

Sign of transposition is '. We have a squared matrix Q. All matrix elements are positive

ou Answered
- Matrix Q'Q is positive semidefinite

orrect Answer
- Matrix Q'Q is positive definite or positive semidefinite

- Matrix Q'Q is positive definite

Question 9

0 / 1 pts

In the case of Hebbian learning the source of learning is "THIS IS YOUR ANSWER".

ou Answered

- (•) Input and output of the neuron multiplied
- ( ) The activity value of the output of the neuron
- ( ) The activity value of the input to the neuron

orrect Answer

- ( ) Input and output of the weight multiplied

Question 10

1 / 1 pts

Why can deep networks be fooled so easily?

- ( ) gradient descent can be stuck in local minima

Correct!

- (•) they work with many dimensional inputs
- ( ) they work with many parameters to be optimized
- ( ) they work with many layers to be optimized

Question 11

1 / 1 pts

What is the dualist resolution of the homunculus fallacy?

- ( ) Outputs are the results of feedforward processing

Measurement theory of quantum physics resolves the fallacy

Correct! The homunculus is immaterial

The homunculus estimates the output

Question 12

0 / 1 pts

The average of independent, identically distributed stochastic variables converges to the "THIS IS YOUR ANSWER" when the number of variables approaches infinity.

variance

ou Answered standard deviation

orrect Answer expected value

Gaussian distribution

Question 13

0 / 1 pts

It follows from the No Free Lunch Thereom that

orrect Answer Random search is just as good as any other method for the full set of optimization problems

ou Answered Random search is the best method amongst all search problems.

orrect Answer No algorithmic solution therefore offers a "short cut".

orrect Answer

- [ ] Intelligence is not efficient on all kinds of optimization problems

Question 14

0 / 1 pts

What is "false belief"?

orrect Answer

- if our observations are thought to be known by the partner

ou Answered

- if the belief is not supported by facts

- if the belief about the "other mind" is false

- if arguments to explain a phenomenon are false

Question 15

1 / 1 pts

What is crowdsourcing?

Correct!

- many people work for a common goal, often innovation, problem solving, or efficiency

- a company gives the task to another that gives to another and so on, forming a chain

- many tasks are solved sequentially (after each other) in several optimizations

- many tasks are solved simultaneously in one optimization

Question 16

1 / 1 pts

Vector A = [2, 3, 4] , B = [3, 4, 5] What is A*B (dot product)?

Correct!

38

orrect Answers

38 (with margin: 0)

Question 17

1 / 1 pts

What is the average of the following numbers? [2,5,4,5]

Correct!

4

orrect Answers

4 (with margin: 0)

Question 18

0 / 1 pts

Given the following random variable x:

P(x=10) = 0.3

P(x=20) = 0.7

What is the expected value of x?

ou Answered

16

orrect Answers

17 (with margin: 0)

Quiz Score: **9** out of 18