Midterm

Due Apr 14 at 4:30pm   **Points** 34   **Questions** 7

Available after Apr 14 at 2pm   **Time Limit** 75 Minutes

Attempt History

	Attempt	**Time**	**Score**
LATEST	[Attempt 1](#)	46 minutes	30.67 out of 34

⚠ Correct answers are hidden.

Score for this quiz: **30.67** out of 34

Submitted Apr 14 at 3:02pm

This attempt took 46 minutes.

Question 1	10 / 10 pts

Consider a restaurant recommendation application (Live2Eat), which shows you nearby restaurants for a given location. Assume that Live2Eat automatically updates the location as the user moves, and that it also updates the nearby restaurants. It has **two options** for obtaining the location information.

The first option: by using GPS, which is more accurate.

The second option: by using the mobile tower-based cellular network, which is far less accurate.

Suppose that there is a Live2Eat user who is driving down a street, and the GPS signal is lost at time t = 0. Also suppose that the average speed of traffic is 10 kmph. The error in GPS localization is 25 m (0.016 miles), while the error in mobile tower-based localization is 300 m (0.19

miles). Consider that location information is requested by Live2Eat every minute.

When should you switch from GPS to cellular? (Explain your answer in worksheet)

○ Right at t = 0

◉ Anytime after 2 mins

○ Anytime after 5 mins

○ Anytime after 7 mins

Question 2   10 / 10 pts

Imagine a scenario where Boeing designed a pilot monitoring system that deploys in response to a failing MCAS system. If an MCAS system is engaged and the pilot is detected to be stressed, MCAS will automatically disengage.

In this system, consider a brain mobile interface application where the pilot wears a Neurosky headset that senses brain signals (EEG) at **400 Hz**. Each brain data point is a 32-bit floating point number. The brain signal is collected by a central controller in the plane and sent to a server, where complex machine learning algorithms are employed to determine the stress level of the pilot.

Additionally, the aircraft is equipped with sensors, such as the AoA, pitch monitoring, and other relevant sensors. The data rate from the AoA is **5 kbps**, and the data rate from the other relevant sensors is **300 kbps**.

Using the data from these sensors, the MCAS disable system attempts to predict MCAS failures. If the system detects that the pilot is stressed and an MCAS failure is predicted, the auto-disable facility should disable MCAS. The auto-disable feature only has 5 seconds to make a decision after collecting 5 seconds worth of data.

There are two options for performing all of the related computation: (a) use a GPU server at the control center, or (b) use a fog server that is onboard the aircraft. The GPU server upload speed is **1 Mbps**, whereas the fog server upload speed is 5 Mbps. However, the computation speed of the GPU server is **1500 kbps** (in other words, it can finish the computation on 1500 kb of data in 1 second), whereas the fog server has a computational speed of *200 kbps**.

What is the computation time for the GPU server and fog server, in milliseconds? (Explain your answer in worksheet)

○ GPU - 1.06 s, Fog - 7.9 s

○ GPU - 7.9 s, Fog - 1.06 s

○ GPU - 3.44 s, Fog -5.91 s

○ GPU - 5.91 s, Fog -3.44 s

Partial

Question 3

2 / 4 pts

Which attacks are forms of causative attacks? *Select all that apply.*

☑ Poisoning attacks

☑ Red herring

☐ Hill climbing

☑ Label flipping

Partial

Question 4   **2.67 / 4 pts**

Which statements are *most* accurate regarding poisoning attacks?
Select all that apply.

☑ You need access to the training dataset to launch this attack.

☐ You need to know the entire machine learning architecture to launch this attack.

☑ The attacks use false labels for the dataset.

☐ The attacks can only be launched on machines which learn in runtime.

Question 5   **2 / 2 pts**

In a tree based replication with n location registrars what is the worst case update cost?

◉ 2 log(n)

○ Log(n)

○ N^2

○ n/2

Question 6
2 / 2 pts

Which statement is the *most* accurate regarding mobile IP?

○ It can be accommodated with IPv4 without any modification.

◉ IPv4 modification is needed to avoid DNS overload.

○ IPv4 modification is needed since more IP addresses are needed.

○ IPv4 modification is needed to support new versions of mobile devices only. With old mobile devices, IPv4 will suffice.

Question 7
2 / 2 pts

When a corresponding host wants to send a packet to a mobile host who is roaming, where is the packet sent?

○ The packet is sent to the foreign address.

○ The packet is sent to the care of address.

◉ The packet is sent to the home agent's IP address.

○ The packet is sent to the mobile host's dynamic IP address.

Quiz Score: **30.67** out of 34