

## **CS 225 Discussion Questions and Talking Points**

Below are discussion questions and talking points about various topics. The discussion runs as follows:

- (a) There are two discussion leaders (the presenters) and the rest of the class are responders.
- (b) All students in the class should read the discussion questions before the lecture and prepare answers to at least some of them, except the discussion leaders who must prepare answers for all questions of the topic they are leading.
- (c) The leaders start by asking the class the discussion questions one at a time, hear 2-3 answers from the rest of the class, then put their answer or clarification.
- (d) If any student in the class does not understand either the question or the answer, he or she should ask.
- (e) The instructor will be overseeing the discussion and interrupt only when necessary.

**Class participation points are assigned based on interactive participation in these discussions.**

### **Spatial keyword search**

1. What is spatial keyword search?
2. What are the famous other names for spatial keyword search?
3. What are the three major queries of spatial keyword search?
4. What is the definition of each major query?
5. List 4-5 of the most cited or recent work on supporting spatial keyword queries

### **Spatio-temporal data**

1. What is spatio-temporal data?
2. Discuss the importance and applications of spatio-temporal data
3. State examples of the main technologies that are sources of spatio-temporal data.
4. What are the main challenges in modeling and managing spatio-temporal data compared to purely spatial or temporal data?

### **Geospatial Artificial Intelligence (GeoAI)**

1. What is GeoAI, and how does it integrate geospatial data with artificial intelligence?
2. What are some real-world applications of GeoAI across different industries?
3. What are the key challenges in developing and implementing GeoAI solutions?
4. What ethical considerations should be taken into account when deploying GeoAI technologies?

### **Remote Sensing**

1. What is Remote Sensing?

2. What are the major types of Remote Sensing technologies and devices?
3. What are the different types of resolutions of Remote Sensing technologies and devices?
4. What is LiDAR?
5. What are the types of LiDAR technologies?
6. What is LiDAR intensity data?
7. Discuss briefly storing and classifying LiDAR data points

### **Spatial data on GPUs**

1. What advantages do Graphics Processing Units (GPUs) offer over traditional CPUs in the context of spatial data analysis?
2. What are some real-world applications where GPU-accelerated spatial data analysis has been effectively implemented?
3. What challenges might arise when implementing GPU-based solutions for spatial data analysis?
4. What considerations should be made when choosing between CPU and GPU processing for a given spatial analysis task?

### **Spatial crowdsourcing**

1. What is Crowdsourcing?
2. What is spatial crowdsourcing, and how does it differ from traditional crowdsourcing?
3. Discuss some of the key algorithmic challenges in designing a spatial crowdsourcing system
4. Discuss some real-world applications of spatial crowdsourcing and explain how they benefit from its unique characteristics
5. What privacy and ethical issues might arise in spatial crowdsourcing, and how can they be mitigated?
6. How might advances in mobile technology and IoT devices influence the future of spatial crowdsourcing?

### **HD Maps**

1. What are High-Definition (HD) Maps and how do they differ from traditional maps?
2. What are the major applications of HD maps?
3. Discuss some of the key components and data elements that make up an HD map, and why are they important?
4. What are the major algorithmic and data challenges involved in creating and maintaining HD maps?