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MORGAN CENTER FOR EQUITABLE AI & MACHINE LEARNING SYSTEMS

Glossary

1. **Artificial Intelligence (AI):** Technology that allows machines to perform tasks that typically require human intelligence, such as learning from experience and making decisions based on data.

2. **Public Transportation**: Systems like buses and trains that are used by the public to travel within cities and between locations.

3. **Traffic Management**: The use of technology and strategies to control and optimize the flow of vehicles on roads and highways.

4. **Logistics**: The detailed coordination of complex operations involving the movement and storage of goods and resources.

5. **Freight**: Goods transported in bulk, typically by trucks, trains, ships, or planes.

6. **Algorithms**: Step-by-step instructions or rules followed by a computer to solve problems or perform tasks.

7. **Traffic Flow**: The movement of vehicles through an area, managed to minimize congestion and delays.

8. **Machine Learning:** A type of AI that enables computers to learn from data and improve their performance over time without being explicitly programmed.

9. **Radar**: A technology that uses radio waves to detect objects and determine their distance, speed, and direction.

10. **Lidar**: A technology that uses laser pulses to measure distances and create detailed, 3D maps of surroundings.

11. **Public Transit**: Transportation services like buses and trains that are available for use by the general public.

12.**Traffic Congestion**: Traffic jams or gridlock caused by too many vehicles on the road at the same time.

13. **Real-time Data**: Information that is updated immediately and reflects current conditions or events.

14. **AI Algorithms**: Instructions or rules used by AI systems to process data and make decisions or predictions.

16. **Sensors**: Devices that detect and respond to inputs from the physical environment, such as temperature, light, or motion.

17.**GPS**: Global Positioning System, a satellite-based navigation system that provides location and time information anywhere on Earth.

18.**Optimize**: To make something as effective, functional, or efficient as possible.

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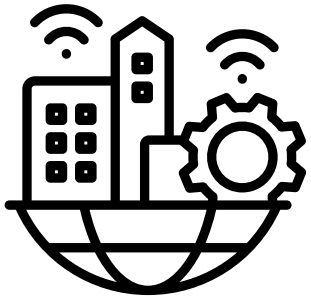
Exploring Smart Cities & AI in Transportation

Instructions: Read the passages below and answer the questions.

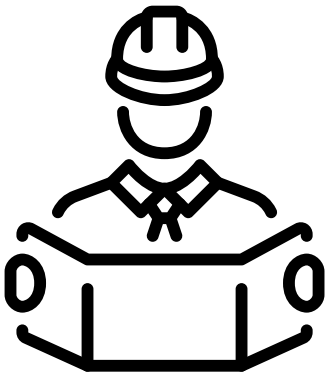
Singapore and Tokyo are considered leading smart cities, where advanced technologies like AI are integrated into daily life. Smart cities use data and technology to improve services like transportation and energy efficiency.



1.What are smart cities?
- A) Cities with lots of traffic
- B) Cities that use data and technology to improve services
- C) Cities with many skyscrapers

2.How does AI help in smart cities?
- A) It makes traffic worse
- B) It improves transportation and energy efficiency
- C) It creates more pollution

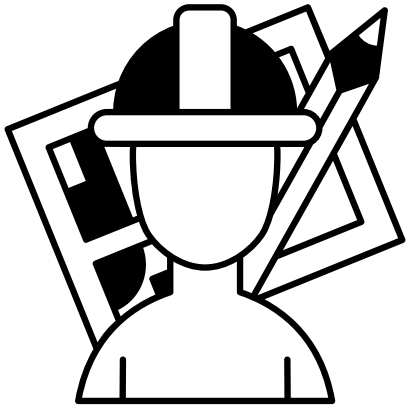
Transportation engineers play a crucial role in designing efficient transportation systems in cities. They analyze traffic patterns, road conditions, and public transportation needs to create solutions that improve daily commutes and reduce congestion.



1.What do transportation engineers do?
- A) Design buildings
- B) Analyze traffic patterns and improve transportation systems
- C) Write books about city planning

2.How do transportation engineers help cities?
- A) They make traffic worse
- B) They improve daily commutes and reduce congestion
- C) They create more roadblocks

Urban planners are responsible for designing the layout of cities to ensure they are functional and sustainable. They consider factors like population growth, environmental impact, and community needs to create plans that promote livability and efficiency.



1.What do urban planners do?
- A) Design parks and recreation centers
- B) Plan the layout of cities and neighborhoods
- C) Study ancient civilizations

2.How do urban planners contribute to cities?
- A) They make cities less livable
-) They promote sustainability and efficiency
- C) They increase traffic congestion

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Design Your Own Smart City !

Imagine you are a transportation engineer or urban planner. Follow the steps below to design a smart city using drawings and descriptions.

1. .**Draw Your Smart City:** Create a detailed picture of your smart city. Include buildings, roads, parks, and transportation systems.
2. **Label the Smart Technologies**: Next to each feature of your smart city, write labels to describe how AI or technology helps. For example, label a traffic light and describe how AI could make it work more efficiently.
3. **Write a Description**: Below your drawing, write a short paragraph (3-5 sentences) explaining why your city is smart and how AI technology makes it better than a regular city.

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FAMILY INTERVIEW

Interview your family about their methods of transportation.

1. What modes of transportation does our family use regularly (e.g., car, bus, train)?

2. Do we use any technology in our vehicles to help with navigation or driving assistance (e.g., GPS, lane departure warning, adaptive cruise control)?

3. Does our car have any self-driving features, and if so, how do they work?

4. Have we noticed any changes in how we navigate or plan trips due to technology like GPS or traffic apps?

5. How do you think AI could improve our daily commuting or travel experiences?

6. Have you heard about AI being used in transportation or logistics (e.g., delivery services, public transportation)? How do you think it impacts these services?

7. How do you think AI could make transportation safer or more efficient in our community?

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REFLECTION WORKSHEET

Answer the following questions about the sphero indi

1. What strategies did you use to break down the problem into smaller parts?

2. How do self-driving cars use AI and obstacle avoidance to navigate safely?

3. Can you think of other industries where AI and obstacle avoidance are important? Give examples.

4. How did pattern recognition help you in programming the Sphero Indi?

5. Why is it important to break down problems into smaller parts?

6. How do you think AI technology will change the way we live in the future?

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OBSERVATION WORKSHEET

Answer the following questions about the sphero indi

1. Describe your initial plan for navigating the Sphero Indi through the obstacle course.

2. Where did the Sphero Indi successfully avoid obstacles

3. Where did the Sphero Indi encounter difficulties

4. How did pattern recognition help you in programming the Sphero Indi?

5. Describe any adjustments you made to the program after the first test.

6. Describe your city layout and the route planned for the Sphero Indi.