Lesson 7

December 2, 2020

A new machine learning algorithm is poised to help urban transportation analysts relieve bottlenecks and chokepoints that routinely snarl city traffic. The tool, called TranSEC, was developed at the U.S. Department of Energy's Pacific Northwest National Laboratory to help urban traffic engineers get access to actionable information about traffic patterns in their cities.

Currently, publicly available traffic information at the street level is sparse and incomplete. Traffic engineers generally have relied on isolated traffic counts, collision statistics and speed data to determine roadway conditions. The new tool uses traffic datasets collected from UBER drivers and other publicly available traffic sensor data to map street-level traffic flow over time. It creates a big picture of city traffic using machine learning tools and the computing resources available at a national laboratory.

"What is novel here is the street level estimation over a large metropolitan area," said Arif Khan, a PNNL computer scientist who helped develop TranSEC. "And unlike other models that only work in one specific metro area, our tool is portable and can be applied to any urban area where aggregated traffic data is available."

TranSEC (which stands for transportation state estimation capability) differentiates itself from other traffic monitoring methods by its ability to analyze sparse and incomplete information. It uses machine learning to connect segments with missing data, and that allows it to make near real-time street level estimations.

In contrast, the map features on our smart phones can help us optimize our journey through a city landscape, pointing out chokepoints and suggesting alternate routes. But smart phone tools only work for an individual driver trying to get from point A to point B. City traffic engineers are concerned with how to help all vehicles get to their destinations efficiently. Sometimes, a route that seems efficient for an individual driver leads to too many vehicles trying to access a road that was not designed to handle that volume of traffic. TranSEC has the potential to initiate a paradigm shift in how traffic professionals monitor and predict system mobility performance.

https://www.sciencedaily.com

A-Skimming

Choose from the list A-F the main idea for paragraphs 1-5. There is one extra letter that you do not need to use.

A. TranSEC is different from other monitoring methods in that it can analyze sparse and incomplete info.

B. There are a thousand tools offering information about traffic patterns in different cities around the world.

C. TranSEC was developed to help engineers get access to information about traffic patterns.

D. The tool uses datasets collected from public sensor data to map street-level traffic flow over time.

E. The tool is portable and can be applied to any urban area where aggregated traffic data is available._

F. City traffic engineers are concerned with how to help all vehicles get to their destinations efficiently.

B-Vocabulary. *Circle the letter corresponding to the best answer for each question.*

1. The noun "algorithm" in line 1 can be described as:

a. a fact
b. a guess
c. a set of instructions
d. a well-substantiated explanation

2. The verb "to map" in line 9-10 can be understood as:

a. to increase
b. to slow down
c. to stop
d. to chart

3. The noun "estimation" in line 12 can be replaced by:

a. calculation
b. information
c. opinion
d. feeling

4. The verb "to analyze" in line 17 can be explained as:

a. to examine
b. to collect
c. to reveal
d. to receive

5. The transitional device "in contrast" in line 20 can be interpreted as:

a. similarly
b. on the other hand
c. fortunately
d. in conclusion

C- Comprehension Questions

1. What will be improved by means of the tool called TranSEC?

a. City dwellings
b. City traffic
c. City facilities
d. City council

2. What is currently used to determine roadway conditions?

a. Traffic counts
b. Collision statistics
c. Speed data
d. All of the above

3. Where can TranSEC be applied?

a. In one specific metropolitan area
b. Over any metropolitan area
c. On the mountains
d. In the country

4. Which of the following statements is NOT TRUE?

a. Smart phones can help optimize city traffic.
b. TranSEC will handle urban transportation more efficiently.
c. TranSEC stands for transportation state estimation capability.
d. TranSEC was developed at the Department of Energy's Pacific Northwest Lab.

5. One can imagine that someday...

a. there will be no traffic jams.
b. there will be less traffic on the streets.
c. motor vehicles will be powered by fossil fuels.
d. cars will take people from point A to point B.

6. The BEST title for this passage would be

a. UBER driver data helps alleviate rush hours
b. Smart phones can help us optimize our journey through a city
c. New machine learning tool tracks urban traffic congestion
d. Traffic engineers are enthusiastic with a new tool to monitor traffic

D-Reference

Write the referent word(s) at the end of each sentence.

1. What does the relative pronoun "that" in line 2 refer to?
2. What does the possessive adjective "their" in line 5 stand for?
3. What does the noun phrase "The new tool" in line 8 point to?
4. Find a synonym in line 13 for the adjective "different".
5. What does the object pronoun "us" in line 20 indicate?
6. What does the possessive adjective "their" in line 23 denote?