APPROVAL NUMBER:

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II nd year. CSE(CA.I)

"Automating the detection of unexpected accidents in tunnels using Networks."

Title 1:

Detecting the automatic detection of unexpected accidents in tunnels using CNN in comparison with LSTM

(a)

Automating the detection of unexpected accidents in tunnels using convolution Neural networks (CNN) in comparison with long short-team memory (LSTM) Networks.

Introduction:

Paragraph 1:

Definition:

Automatic detection of un-expected accidents in tunnels is crucial for ensuring the safety of both motorists and tunnel infrastructure. In recent years, advancements in deep learning techniques, particularly CNN and LSTM networks, have shown promise in enhancing the accuracy & efficiency of accidents detection systems.

Important:

CNN are well-known for their effectiveness in image-based tasks, making them suitable for processing visual data such as surveillance footage from tunnel cameras. these networks can learn hierarchical features from from images. enabling them to identify patterns indicative of accidents. such as. smoke, fire or sudden changes in traffic flow.

Applications:

Detecting unexpected accidents in tunnels can be benefited the combination of convolutional neural network (CNN) and long-short memory (LSTM) networks. CNN are effective in spatial feature extra from images or video frame while LSTM excel at capturing tempora dependencies over time.

Paragraph 2:

Total No.of articles published on this topic:

Over the past 5 years. Google scholar and IEEE xplore database have collectively published over 500 articles on this topic.

*among the most sited articles are there by.

→ E.S. Lee. W. choi, D. Kum " Birds eye view localization of surrounding vehicles: longitudinal and lateral distance estimation with partial appearance. Robotics and autonomous system. 2021 Vol. 141 PP. 259268

→ A. Krizhevsky. I. sutskever. G. Hinton, " Image Net classification on deep convolutional neural networks. Proc. Advances in Neural information processing systems, PP. 1106.1114, 2017

3. Over all which is the best in your opinion.

→ A. Krizhevsky. I. sutskever. G. Hinton, "Image Net classification with deep convolutional neural network ("development of a deep learning based automatic tracking of moving vehicles and incident detection.)

Paragraph 3:

Existing research limits:

Research on automatic accidents detection in tunnels using CNN and LSTM models has made significant strides, yet certain limitations persist. CNN excel at spatial feature extraction, beneficial for image-based data such as tunnel surveillance footage.

the other hand. LSTM, specialized in sequential data, can
capture temporal patterns.

Materials and Methods:

Paragraph 1:

→ Study setting : SIMATS (SSE)
→ No. of groups : 2
→ Sample size : 638
→ Total size : 1276

Paragraph 2:

Testing set up:

Googlecolab
kaggle.com

Testing procedure:

* Communicate the purpose and goals of the test.
* Base line measurement before taking task.
* Experimental manipulation.
* Task execution.
* Data Analysis.
* conclusion.

Paragraph 3:

Sample preparation methods for Outline.

→ Data selection, collection & cleaning
→ coding
→ Documentation
→ Quality control
→ Review.

Paragraph 4:

Sample preparation Group!

* Data collection
* Simple selection criteria
* Data cleaning
* Sample code
* Documentation
* steps for preparation
* Validation
* Result.

Paragraph 5:

Data was collected from kaggle, google scholar, statistical software spss
Independent variable: Machine learning and Artifical intelligence.

Result and discussion:

In a comprehensive study comparing CNN and LSTM for the automatic detection of unexpected accidents in tunnels, several keys finding emerged. the CNN model exhibited superior performance in capturing spatial features within tunnel imagey, enabling it to effictively identity anomalies in real-time.

* on the other hand, LSTMs. with their ability to model temporal dependencies, demonstrated a nuanced understanding of sequential patterns in accident data.

Limitations of our research:

While employing CNN and LSTM for automatic detection of unexpected accidents in tunnels offers promising avenues. there are inherent limitations to consider in our research. firstly, CNN excel in spatial feature extraction but may struggle to capture temporal dependencies crucial for accident detection over time.

ge Scope:

The future scope of detecting unexpected accidents in tunnels using CNN and LSTM holds great promise. CNNs excel at spatial feature extraction, making them effective in analyzing visual data from tunnel surveillance cameras

Conclusion:

In conclusion, the comparison between CNN and LSTM for automatic detection of unexpected accidents in tunnels reveals distinctive strengths. CNN excel in spatial feature extraction, effectively capturing patterns in image data. in tunnel surveillance.

Graph:

∴ Simple Bar mean of accuracy by group