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## Methods For Spatio-Temporal Scene-Graph Embedding For Autonomous Vehicle Applications

Tech ID: 34210 / UC Case 2022-933-0

### BRIEF DESCRIPTION

A revolutionary approach to enhancing the safety and efficiency of autonomous vehicles through advanced scene-graph embeddings.

### FULL DESCRIPTION

This technology introduces a novel spatio-temporal scene-graph embedding methodology designed to improve the safety and reliability of Autonomous Driving Systems (ADS). By accurately modeling the complex and dynamic relationships between objects in a driving scene, this approach enables more precise risk assessments and collision predictions, making autonomous navigation safer in urban environments.

### SUGGESTED USES

- Autonomous vehicle navigation and safety systems.
- Real-time traffic monitoring and management solutions.
- Advanced driver-assistance systems (ADAS) for consumer vehicles.

### ADVANTAGES

- Enhanced collision prediction accuracy and earlier detection of potential accidents.
- Significant reduction in model size and energy use making it ideal for edge computing on autonomous vehicles.
- Improved ability to transfer knowledge from synthetic to real-world driving datasets, enhancing model generalization.
- Superior explainability of decision-making processes through detailed scene-graph representations.

### PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	12406583	09/02/2025	2022-933

### RELATED MATERIALS

### CONTACT

Ben Chu  
ben.chu@uci.edu  
tel: .



### OTHER INFORMATION

### CATEGORIZED AS

- » **Computer**
  - » Software
- » **Sensors & Instrumentation**
  - » Position sensors
- » **Transportation**
  - » Automotive

### RELATED CASES

2022-933-0

» Yu, S.-Y., et al. Al Faruque, M. A. (2022). Scene-Graph Augmented Data-Driven Risk Assessment of Autonomous Vehicle Decisions. IEEE Trans. Intell. Transp. Syst, 23 (7)

» Malawade, A. V, et al. Al Faruque, M. A. (2022). Spatiotemporal Scene-Graph Embedding for Autonomous Vehicle Collision Prediction. IEEE Internet Things J., 9 (12)

**UCI** Beall  
Applied Innovation

5270 California Avenue / Irvine, CA  
92697-7700 / Tel: 949.824.2683



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