

CSE523 - Machine Learning

Weekly Report 4

**Classification of Drivers based on their Driving Patterns**

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This week , we focused on research papers that are classifying drivers based on their driving trajectories, We particularly focused on “A Context-Aware Framework for Risky Driving Behavior Evaluation Based on Trajectory Data”.

### Key Points:

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### Research Paper Analysis: We thoroughly analyzed the research paper titled "A Context-Aware Framework for Risky Driving Behavior Evaluation Based on Trajectory Data." This paper provides insights into a context-aware framework designed to evaluate risky driving behaviors using trajectory data.

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### Understanding Methodology: We successfully grasped the methodology proposed in the research paper. The framework consists of three main models: identifying context, determining risky maneuvers, and evaluating risky driving behaviors. It employs a surrogate-based method for labeling risky maneuvers, extracts driving trajectory features, and utilizes supervised machine learning algorithms for modeling relationships.

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### Comparative Analysis: The paper conducts a comparative analysis of three feature extraction methods and five classifiers to select the most suitable combination for evaluating risky driving behaviors. This comparison aids in understanding the effectiveness of different techniques in classifying driving behaviors.

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### Context-Aware Evaluation: A notable aspect of the proposed framework is its context-aware evaluation approach. By considering context factors, such as environmental conditions or traffic density, the framework enhances the accuracy of identifying risky driving behaviors.

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### Validation with UAV Trajectory Data: The research paper validates the proposed framework using trajectory data extracted from unmanned aerial vehicles (UAVs). This validation demonstrates the applicability and effectiveness of the framework in real-world scenarios.

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### Achievable Accuracy: The results presented in the paper indicate that the proposed framework can achieve a remarkable accuracy of 97% in evaluating risky driving behaviors. This high accuracy underscores the potential of the framework for improving driving safety.

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### **References:**

Q. Xue, K. Gao, Y. Xing, J. Lu and X. Qu, "A Context-Aware Framework for Risky Driving Behavior Evaluation Based on Trajectory Data," in IEEE Intelligent Transportation Systems Magazine, vol. 15, no. 1, pp. 70-83, Jan.-Feb. 2023, doi: 10.1109/MITS.2021.3120279.

keywords: {Feature extraction;Context modeling;Vehicles;Trajectory;Automobiles;Data models;Discrete wavelet transforms;Context awareness},