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Automatic Data Annotation and Self-Learning Models Using Causation to Relate Disparate Events

Tech ID: 33738 / UC Case 2024-931-0

BRIEF DESCRIPTION

This technology introduces a novel end-to-end method for automatic data annotation and generation based on robust temporal causality among data streams, enhancing machine learning model accuracy and adaptability.

FULL DESCRIPTION

Researchers at UC Irvine have developed an innovative approach to automatically generate and annotate training datasets for machine learning (ML), using causal relationships between interacting entities to automatically select and label data samples in real-time, post-deployment. This method significantly reduces the labor and time costs associated with manual data annotation, facilitating continual learning and adaptation of ML models in dynamic environments.

SUGGESTED USES

- » Advanced driver assistance systems through automatic data generation.
- » Autonomous driving, particularly in understanding driver yield intention and lane changing behaviors.
- » Continual learning platforms for machine learning models across various fields.
- » Human-robot interactions in manufacturing and other industrial applications
- » Integrated software and hardware platforms for enhancing AI applications with continual learning capabilities.
- » Real-time decision-making systems in dynamic environments such as manufacturing, agriculture, IoT, Virtual/Mixed Reality, and autonomous navigation.

ADVANTAGES

- » Significantly reduces labor and time costs for data annotation.
- » Improves machine learning model accuracy through enhanced dataset quality.
- » Facilitates continual learning and model adaptation to new data without manual intervention.
- » Leverages temporal causal relationships for automatic data labeling, enabling better domain adaptation.
- » Minimizes the need for large sets of manually labeled data.

PATENT STATUS

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OTHER INFORMATION

CATEGORIZED AS

- » **Computer**
- » Software

RELATED CASES

2024-931-0

Country	Type	Number	Dated	Case
United States Of America	Published Application	20250139446	05/01/2025	2024-931

Additional Patent Pending

RELATED MATERIALS

» Y. Ren, A. Yen and G. Li, "A Self-Labeling Method for Adaptive Machine Learning by Interactive Causality" in IEEE Transactions on Artificial Intelligence, vol. 5, no. 05, pp. 2093-2102, 2024. doi: 10.1109/TAI.2023.3311782

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