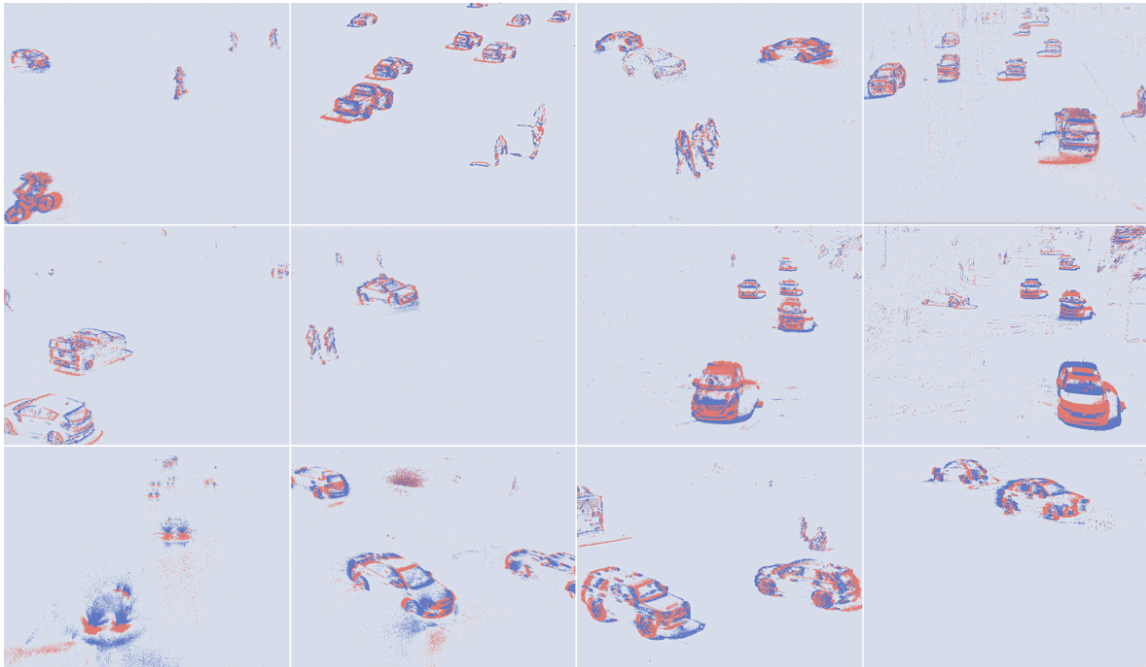


# eTraM Dataset Documentation

Version: **Beta** (last updated on April 20, 2024)

eTraM PDF: <https://arxiv.org/pdf/2403.19976.pdf>

eTraM: [Link to Dataset](#)



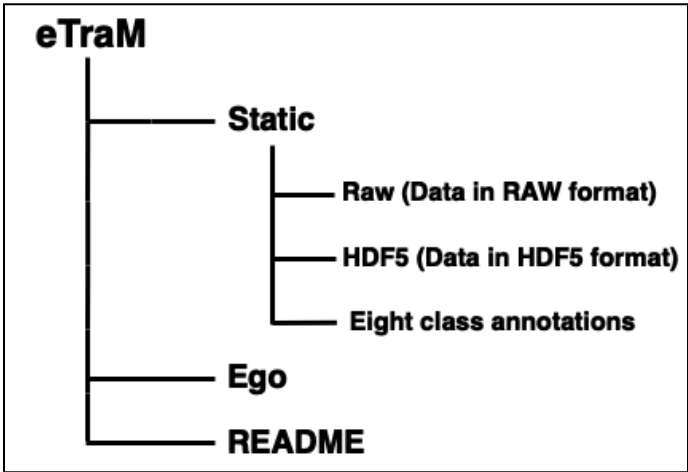
Event cameras, with their high temporal and dynamic range and minimal memory usage, have found applications in various fields. However, their potential in static traffic monitoring remains largely unexplored. To facilitate this exploration, we present eTraM - a first-of-its-kind, fully event-based traffic monitoring dataset. eTraM offers 10 hr of data from different traffic scenarios in various lighting and weather conditions, providing a comprehensive overview of real-world situations. Providing 2M bounding box annotations, it covers eight distinct classes of traffic participants, ranging from vehicles to pedestrians and micro-mobility. A short video overview of eTraM is available [here](#).

The data was collected using the Prophesee EVK4 HD camera with a resolution of 1280x720 px and a dynamic range exceeding 120 dB, making it exceptionally capable of capturing detailed traffic events under varying lighting and weather conditions. Annotations were crafted using CVAT.ai, ensuring high precision in bounding boxes and consistency across the dataset.

The data is collected from several locations around the ASU campus and a suburban area in Anthem, AZ, carefully selected to provide a broad spectrum of traffic interactions. Data collection sites are listed below.

Location Name	Address/Coordinates	Description
Downtown Tempe	118 W 7th St, Tempe, AZ 85281	A busy urban area with diverse data on vehicle dynamics, pedestrian flow, and complex interactions among traffic participants.
ASU Bridge	452 E University Dr, Tempe, AZ 85281	Key location within the ASU campus, offering insights into pedestrian and bicycle traffic.
University & Rural	E University Dr & S Rural Rd, Tempe, AZ 85281	High traffic volume intersection, ideal for analyzing vehicular maneuvers and interactions at traffic signals.
Tyler & McAllister	651 E University Dr, Tempe, AZ 85281	Mixes academic and residential traffic, showing a variety of vehicles and pedestrian activities.
Anthem Crossroads	N Gavilan Peak Pkwy, Anthem, AZ 85086	Suburban setting north of Phoenix, adding traffic patterns and participant behaviors different from urban locations.

Multiple sequences are captured throughout the day from each location and during weather conditions. These data sequences are further divided into 3 to 5-minute chunks to improve the multi-threading for preprocessing and data access during model training. The uncompressed size of the dataset in RAW format is approximately 150GB. The dataset is organized using the following folder structure.



eTraM sequences are provided in Raw and HDF5 formats. The annotations available in the RAW and HDF5 folders are the grouped annotations (Pedestrian, Vehicle, and Micro-mobility) that were used to establish the baselines.

The Eight class annotations folder contains fine-grained annotations (Pedestrian, Car, Bicycle, Bus, Motorbike, Truck, Tram, Wheelchair) for the above data.

CVAT (Computer Vision Annotation Tool), an open-source, web-based tool, was used for annotation. CVAT.ai supports for assignment of unique tracking IDs and interpolation of bounding boxes between frames, greatly improving the efficiency of the annotation process. The annotations are provided in the following format,

Key	Description
t	Timestamp of the annotated frame
x	Top-left X coordinate of the bounding box
y	Top-left Y coordinate of the bounding box
w	Width of the bounding box
h	Height of the bounding box
class_id	Class ID of the instance
object_id	Tracking ID of the instance
confidence	Detection confidence

Please note that the dataset is provided under the [Creative Commons Attribution-NonCommercial-ShareAlike \(CC BY-NC-SA\)](#) license, which means that users are free to share and adapt the data for non-commercial purposes as long as appropriate credit is given, and any resulting works are shared under the same license.