

# EPIC Kitchens Dataset

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[Website](#)

## Authors

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## Citing

When using the dataset, kindly reference:

DimaDamen, Hazel Doughty, Sanja Fidler, Giovanni Maria Farinella, Antonino Furnari, Evangelos Kazakos, Davide Moltisanti, Jonathan Munro, Toby Perrett, Will Price, Michael Wray (2018). Scaling Egocentric Vision: The EPIC-KITCHENS Dataset.

(Check publication [here](#))

## Dataset Details

### Ground Truth

We provide ground truth for action segments and object bounding boxes.

- **Objects:** Full bounding boxes of narrated objects for every annotated frame.
- **Actions:** Split into narrations and action labels:
  - Narrations containing the narrated sentence with the timestamp.
  - Action labels containing the verb and noun labels along with the start and end times of the segment.

## Dataset Splits

The dataset is comprised of three splits with the corresponding ground truth:

- Training set - Full ground truth.
- Seen Kitchens (S1) Test set - Start/end times only.
- Unseen Kitchens (S2) Test set - Start/end times only.

Initially we are only releasing the full ground truth for the training set in order to run action and object challenges.

## Important Files

- README.md ([this file](#))
- README.html
- README.pdf
- [license.txt](#)
- [EPIC\\_train\\_action\\_narrations.csv](#) (Info).
- [EPIC\\_train\\_action\\_labels.csv](#) (Info).
- [EPIC\\_train\\_action\\_labels.pkl](#) (Info).
- [EPIC\\_train\\_object\\_labels.csv](#) (Info).
- [EPIC\\_test\\_s1\\_timestamps.csv](#) (Info).
- [EPIC\\_test\\_s1\\_timestamps.pkl](#) (Info).
- [EPIC\\_test\\_s2\\_timestamps.csv](#) (Info).
- [EPIC\\_test\\_s2\\_timestamps.pkl](#) (Info).
- [EPIC\\_verb\\_classes.csv](#) (Info).
- [EPIC\\_noun\\_classes.csv](#) (Info).

We direct the reader to [RDSF](#) for the videos and rgb/flow frames.

We provide html and pdf alternatives to this README which are auto-generated.

## Files Structure

### EPIC\_train\_action\_narrations.csv

CSV file containing 5 columns:

*Note: The start/end timestamp refers to the start/end time of the narration, not the action itself.*

| Column Name    | Type   | Example | Description            |
|----------------|--------|---------|------------------------|
| participant_id | string | P03     | ID of the participant. |

| Column Name                  | Type   | Example      | Description  |
|------------------------------|--------|--------------|--|
| <code>video_id</code>        | string | P03_01       | Video the segment is in.                                       |
| <code>start_timestamp</code> | string | 00:23:43.847 | Start time in HH:mm:ss.SSS of the narration.                   |
| <code>stop_timestamp</code>  | string | 00:23:47.212 | End time in HH:mm:ss.SSS of the narration.                     |
| <code>narration</code>       | string | close fridge | English description of the action provided by the participant. |

#### EPIC\_train\_action\_labels.csv

CSV file containing 14 columns:

| Column Name                  | Type                       | Example      | Description  |
|------------------------------|----------------------------|--------------|--|
| <code>uid</code>             | int                        | 6374         | Unique ID of the segment.  |
| <code>video_id</code>        | string                     | P03_01       | Video the segment is in.   |
| <code>narration</code>       | string                     | close fridge | English description of the action provided by the participant.   |
| <code>start_timestamp</code> | string                     | 00:23:43.847 | Start time in HH:mm:ss.SSS of the action.  |
| <code>stop_timestamp</code>  | string                     | 00:23:47.212 | End time in HH:mm:ss.SSS of the action.  |
| <code>start_frame</code>     | int                        | 85430        | Start frame of the action (WARNING only for frames extracted as detailed in <a href="#">Video Information</a> ). |
| <code>stop_frame</code>      | int                        | 85643        | End frame of the action (WARNING only for frames extracted as detailed in <a href="#">Video Information</a> ).   |
| <code>participant_id</code>  | string                     | P03          | ID of the participant.   |
| <code>verb</code>            | string                     | close        | Parsed verb from the narration.  |
| <code>noun</code>            | string                     | fridge       | First parsed noun from the narration.  |
| <code>verb_class</code>      | int                        | 3            | Numeric ID of the parsed verb's class.   |
| <code>noun_class</code>      | int                        | 10           | Numeric ID of the parsed noun's class.   |
| <code>all_nouns</code>       | list of string (1 or more) | ['fridge']   | List of all parsed nouns from the narration.   |
| <code>all_nouns_class</code> | list of int (1 or more)    | [10]         | List of numeric IDs corresponding to all of the parsed nouns' classes from the narration.                        |

Please note we have included a python pickle file for ease of use. This includes a pandas dataframe with the same layout as above.

#### EPIC\_train\_object\_labels.csv

CSV file containing 6 columns:

| Column Name    | Type                        | Example                  | Description  |
|----------------|-----------------------------|--------------------------|--|
| noun_class     | int                         | 20                       | Integer value representing the class in noun-classes.csv.                    |
| noun           | string                      | bag                      | Original string name for the object.   |
| participant_id | string                      | P01                      | ID of participant.   |
| video_id       | string                      | P01_01                   | Video the object was annotated in.   |
| frame          | int                         | 056581                   | Frame number of the annotated object.  |
| bounding_boxes | list of 4-tuple (0 or more) | "[(76, 1260, 462, 186)]" | Annotated boxes with format (<top:int>,<left:int>,<width:int>,<height:int>). |

#### EPIC\_test\_s1\_timestamps.csv

CSV file containing 7 columns:

| Column Name     | Type   | Example      | Description  |
|-----------------|--------|--------------|--|
| uid             | int    | 1924         | Unique ID of the segment.  |
| participant_id  | string | P01          | ID of the participant.   |
| video_id        | string | P01_11       | Video the segment is in.   |
| start_timestamp | string | 00:00:00.000 | Start time in HH:mm:ss.SSS of the action.  |
| stop_timestamp  | string | 00:00:01.890 | End time in HH:mm:ss.SSS of the action.  |
| start_frame     | int    | 1            | Start frame of the action (WARNING only for frames extracted as detailed in <a href="#">Video Information</a> ). |
| stop_frame      | int    | 93           | End frame of the action (WARNING only for frames extracted as detailed in <a href="#">Video Information</a> ).   |

Please note we have included a python pickle file for ease of use. This includes a pandas dataframe with the same layout as above.

#### EPIC\_test\_s2\_timestamps.csv

CSV file containing 7 columns:

| Column Name     | Type   | Example      | Description                               |
|-----------------|--------|--------------|---|
| uid             | int    | 15582        | Unique ID of the segment.                 |
| participant_id  | string | P09          | ID of the participant.                    |
| video_id        | string | P09_01       | Video the segment is in.                  |
| start_timestamp | string | 00:00:01.970 | Start time in HH:mm:ss.SSS of the action. |

| Column Name                 | Type   | Example      | Description  |
|-----------------------------|--------|--------------|--|
| <code>stop_timestamp</code> | string | 00:00:03.090 | End time in HH:mm:ss.SSS of the action.  |
| <code>start_frame</code>    | int    | 118          | Start frame of the action (WARNING only for frames extracted as detailed in <a href="#">Video Information</a> ). |
| <code>stop_frame</code>     | int    | 185          | End frame of the action (WARNING only for frames extracted as detailed in <a href="#">Video Information</a> ).   |

Please note we have included a python pickle file for ease of use. This includes a pandas dataframe with the same layout as above.

### EPIC\_verb\_classes.csv

CSV file containing 3 columns:

| Column Name            | Type                       | Example                          | Description                                    |
|------------------------|----------------------------|----------------------------------|--|
| <code>verb_id</code>   | int                        | 3                                | ID of the verb class.                          |
| <code>class_key</code> | string                     | close                            | Key of the verb class.                         |
| <code>verbs</code>     | list of string (1 or more) | "['close', 'close-off', 'shut']" | All verbs within the class (includes the key). |

### EPIC\_noun\_classes.csv

CSV file containing 3 columns:

*Note: a colon represents a compound noun with the more generic noun first. So pan:dust should be read as dust pan.*

| Column Name            | Type                       | Example                   | Description                                    |
|------------------------|----------------------------|---------------------------|--|
| <code>noun_id</code>   | int                        | 2                         | ID of the noun class.                          |
| <code>class_key</code> | string                     | pan:dust                  | Key of the noun class.                         |
| <code>nouns</code>     | list of string (1 or more) | "['pan:dust', 'dustpan']" | All nouns within the class (includes the key). |

## Video Information

Videos are recorded in 1080p at 59.94 FPS on a GoPro Hero 5 with linear field of view. There are a minority of videos which were shot at different resolutions, field of views, or FPS due to participant error or camera. These videos identified using `ffprobe` are:

- 1280x720: P12\_01, P12\_02, P12\_03, P12\_04.

- 2560x1440: P12\_05, P12\_06
- 29.97 FPS: P09\_07, P09\_08, P10\_01, P10\_04, P11\_01, P18\_02, P18\_03
- 48 FPS: P17\_01, P17\_02, P17\_03, P17\_04
- 90 FPS: P18\_09

The GoPro Hero 5 was also set to drop the framerate in low light conditions to preserve exposure leading to variable FPS in some videos. If you wish to extract frames we suggest you resample at 60 FPS to mitigate issues with variable FPS, this can be achieved in a single step with FFmpeg:

```
ffmpeg -i "P##_*.MP4" -vf "scale=-2:256" -q:v 4 -r 60 "P##_*/frame_%010d.jpg"
```

where ## is the Participant ID and \*\* is the video ID.

Optical flow was extracted using a fork of [gpu\\_flow](#) made [available on github](#). We set the parameters: stride = 2, dilation = 3, bound = 25 and size = 256.

## Video Downloads

Due to the size of the dataset we provide three scripts for downloading the [videos](#), [frames](#) or [object annotation images](#) separately.

*Note: These scripts will work for Linux and Mac. For Windows users a bash installation should work.*

These scripts replicate the folder structure of the dataset release, found [here](#).

If you wish to download part of the dataset instructions can be found [here](#).

## License

All files in this dataset are copyright by us and published under the Creative Commons Attribution-NonCommercial 4.0 International License, found [here](#). This means that you must give appropriate credit, provide a link to the license, and indicate if changes were made. You may do so in any reasonable manner, but not in any way that suggests the licensor endorses you or your use. You may not use the material for commercial purposes.

## Changelog

- 09/04/18: Initial Release