Event-based Vision Workshop CVPR 2025 - Event-based Eye Tracking Challenge

Your Team Name Here
Your Names*

March 16, 2025

This document consists of two parts: 1. Email final submission guide 2. Factsheet template (starting from Section Factsheet template). The email final submission is meant to gather the necessary information for participating in the final challenge ranking and the challenge report draft. The factsheet is meant to structure the description of the contributions made by each participating team in the challenge.

The general aspects below are important for the participants and the challenge organization:

1. Reproducibility is a must and needs to be checked for the final test results to qualify for the awards. This is achieved with the factsheet and code submission.

2. The main winners will be decided based on overall performance, novelty, and to solutions that stand up as the best in a particular subcategory the judging committee will decide.

3. The teams invited to submit their code and factsheet will be invited to co-author the CVPR 2025 Event-based Eye Tracking Challenge report.

4. The invited teams are also invited to submit papers with their solutions to the CVPR 2025 workshop.

The factsheet, source codes/executables, and additional results (if any) should be sent to the organizers by email with the following guidelines:

Email final submission guide

To: chang.gao@tudelft.nl; q.chen@liacs.leidenuniv.nl;
cc: your_team_members
Subject: 2025 Event-based Eye Tracking Challenge - TEAM_NAME

*Affiliations

Body contents should include:
a) the challenge name
b) team name
c) team leader's name and email address
d) the rest of the team members
e) affiliations of team members
f) team name and user names on the challenge platform (e.g., Kaggle)
g) **executable/source code attached or download links**
h) **factsheet attached**
i) download link from the shared folder or cloud to the results (e.g., submission.csv, corresponding model checkpoint, and any additional results if indicated in the factsheet.). Please make sure the access right is given with the link.

Model checkpoints and other parameters should be provided so that we can run it and reproduce results. There should be a README or descriptions that explain how to execute the executable/code.

The factsheet must be a compiled pdf file together with a zip with .tex factsheet source files (including figures) such that the content can be easily adopted for the final challenge report.

1 Factsheet template

The following sections of contents should be included in the factsheet. Please recycle the following sections and fill in the content in the .tex format with associated materials such as figures.

1.1 Team Details

- Team name
- Team leader name
- Team leader institution and email (Please ensure it is an active email)
- Rest of the team members
- Team website URL (if any)
- Affiliations
- Usernames on the Kaggle leaderboard
- Link to the codes/executables of the solution(s)
- Link to other forms of results, including checkpoints, visualizations etc.

1.2 Contribution Details

- Title of the contribution
- General method description
  - Briefly describe the core algorithm or approach used in your solution.
  - Highlight any innovative techniques or technologies employed.
- References
  - Include citations to any publications, libraries, or frameworks you've utilized or referenced in your solution.
- Representative image/diagram of the method(s)
  - Provide a visual that summarizes or represents your methodology, such as an architecture diagram or flowchart.
- Have you tested previously published methods? (yes/no)
  - If yes, please specify which methods and summarize the results or issues encountered.
- Other methods and baselines tested (even if results were not top competitive).
  - Mention any additional experiments or methodologies you explored, regardless of their final performance.

1.3 General Methodology Overview

Please cover the bullet points in this section as much as possible.

- Overall complexity of the proposed eye-tracking solution, including all stages of development and deployment.
- Disclosure of any pre-trained or external methods/models utilized at any stage of the process.
- Specification of any additional data utilized beyond the dataset provided by the 2025 Eye Tracking Challenge.
- Detailed description of the training process, including any novel techniques or approaches employed.
- Explanation of the testing and validation procedures to ensure the accuracy and robustness of the eye-tracking solution.
- Quantitative and qualitative advantages of the proposed solution over existing methods.

- Performance of the proposed solution on other metrics, this can include accuracy with different pixel tolerance, mean Euclidean distances etc.
- Performance of the proposed solution on other benchmarks or datasets, if tested.
- Novelty and originality of the solution, including any previously unpublished methods or techniques.
- Ethical statement on the use of other works, ensuring proper credits are given and avoiding any form of misconduct.

Please complete the following table with the technical specifications of your solution. This table should provide a quick reference to the key technical aspects of your submission.

Input Size	Training Time	Epochs	Extra Data	Pre-trained Models	Attention Mechanisms	Quantization	Parameters	Inference Time	GPU
e.g., (80, 60, 2)	48h	200	Yes/No	Used/Not Used	Yes/No	Yes/No	10 Million	10ms	RTX 3090

Table 1: Technical Specification of the Proposed Eye-Tracking Solution

1.4 Competition Particularities

This competition is distinct from other challenges in its focus on developing an event-based eye-tracking system. Unlike traditional eye-tracking systems, event-based tracking offers high-speed sampling and reduced power consumption, which are critical for applications in consumer electronics, augmented/virtual reality (AR/VR), and neuroscience research. This necessitates innovative approaches in processing sparse input data streams and integrating with event cameras.

If your methods have any particularities in these aspects including efficiency, exploiting event data sparsity, etc, **please specify in more detail in this section.** If this does not apply to your method you could leave this section blank.

1.5 Technical Details

Participants are encouraged to use Python for implementing their solutions, as also provided in the sample code pipeline, with the flexibility to choose between various deep learning frameworks such as PyTorch or TensorFlow. **If you have inference-specific acceleration strategies, you are welcomed to specify the details in this section**. Key aspects of the implementation include:

- **Framework:** Specify the deep learning framework used (e.g., PyTorch, TensorFlow).
- **Optimizer and Learning Rate:** Details of the optimizer (e.g., Adam, SGD) and learning rate settings.

- **GPU:** Information about the GPU utilized for training, including model and memory capacity.
- **Datasets:** Description of the datasets used for training, including preprocessing steps and data augmentation techniques.
- **Training Time:** Total duration of the training process.
- **Training Strategies:** Outline any special training strategies employed, such as transfer learning, fine-tuning, or curriculum learning.
- **Efficiency Optimization Strategies:** Techniques used to optimize the model for better performance and efficiency, considering the unique challenges posed by event-based eye tracking.

1.6 Other Details

- **Planned Submission of a Challenge Paper at CVPR 2025 Workshop:** [YES/NO]. Specify whether you plan to submit a detailed paper describing your solution to the event-based vision workshop associated with CVPR 2025.
- **If the challenge paper is accepted, do you plan to have a representative of your team to present the work in person at the CVPR workshop in Seattle?** [YES/NO]
- **General Comments and Impressions of the 2025 Event-based Eye Tracking Challenge:** We welcome your feedback to enhance future editions of this competition. Please share your experiences, challenges faced, and suggestions for improvement.
- **Expectations from Future Challenges in Event-based Systems:** Share your thoughts on what you hope to see in future challenges related to event-based systems, eye tracking, or other applications of neuromorphic engineering. This could include suggestions on datasets, problem statements, or technology integrations.