



GRIFFIN



Advanced
Grant

ASAP

Adaptative Scheme for Asynchronous Processing
of event-based vision algorithm

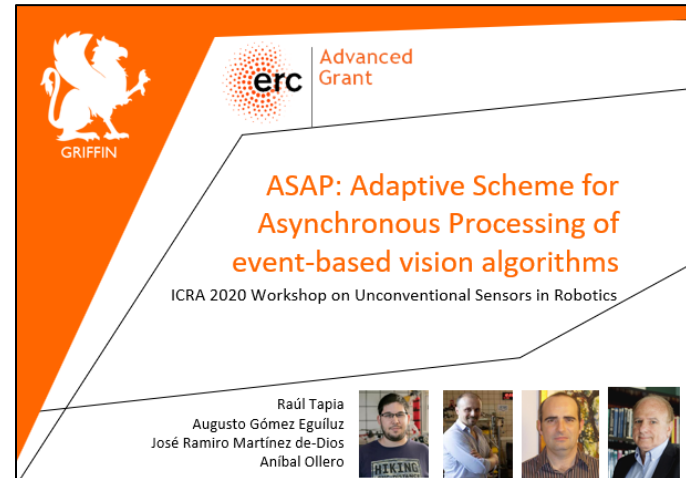


Overview

- Introduction
- Adaptive Scheme for Asynchronous Processing
- Experimental results
- Conclusions
- Future work

Introduction

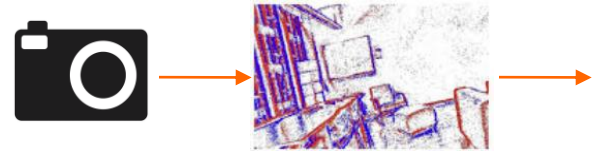
- This work is an extension of a previous publication in an ICRA 2020 workshop [1].
- Dynamic package size adaptation during asynchronous event processing to take full advantage of the event cameras.



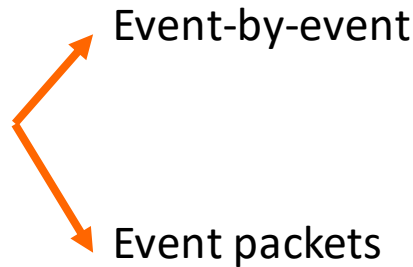
[1] Raúl Tapia, Augusto Gómez Eguíluz, José Ramiro Martínez-de Dios & Anibal Ollero, (2020, June). ASAP: Adaptive Scheme for Asynchronous Processing of event-based vision algorithms. In *IEEE International Conference on Robotics and Automation (ICRA) 2020 Workshop on Unconventional Sensors in Robotics*.

Event Processing

Image-based
(Synchronous)



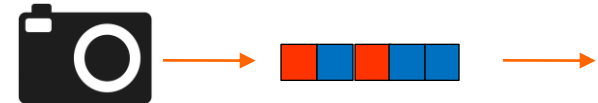
Event-based
(Asynchronous)



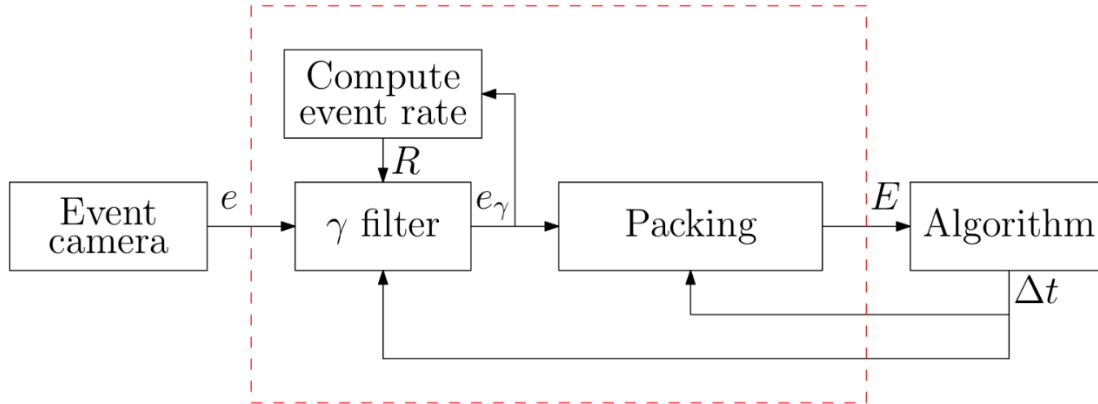
Event-by-event



Event packets

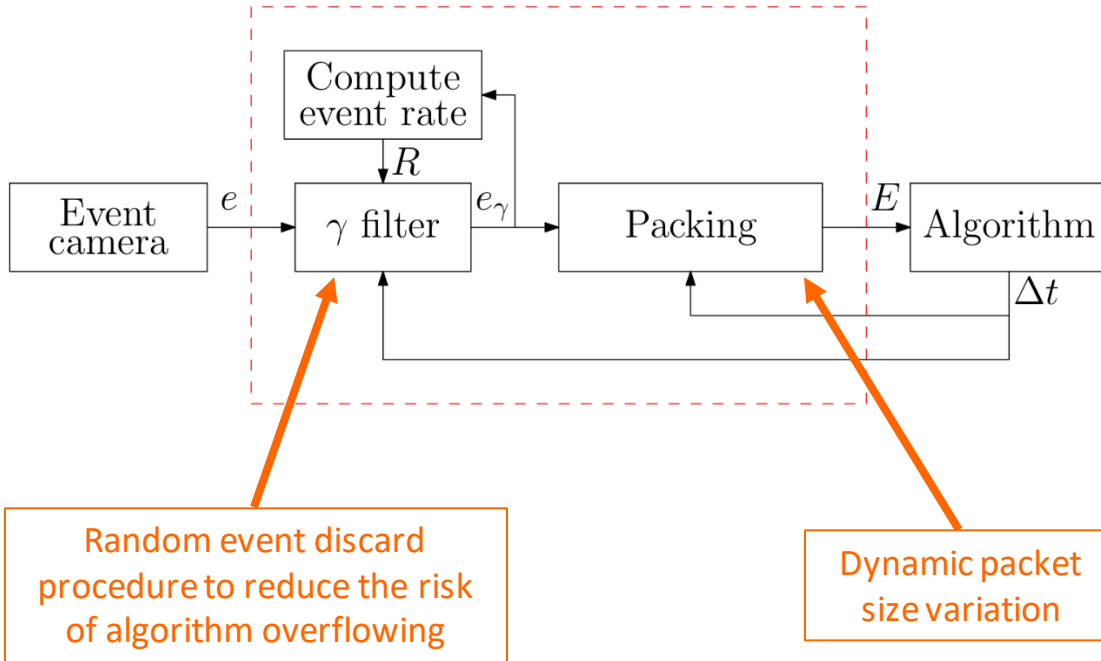


ASAP

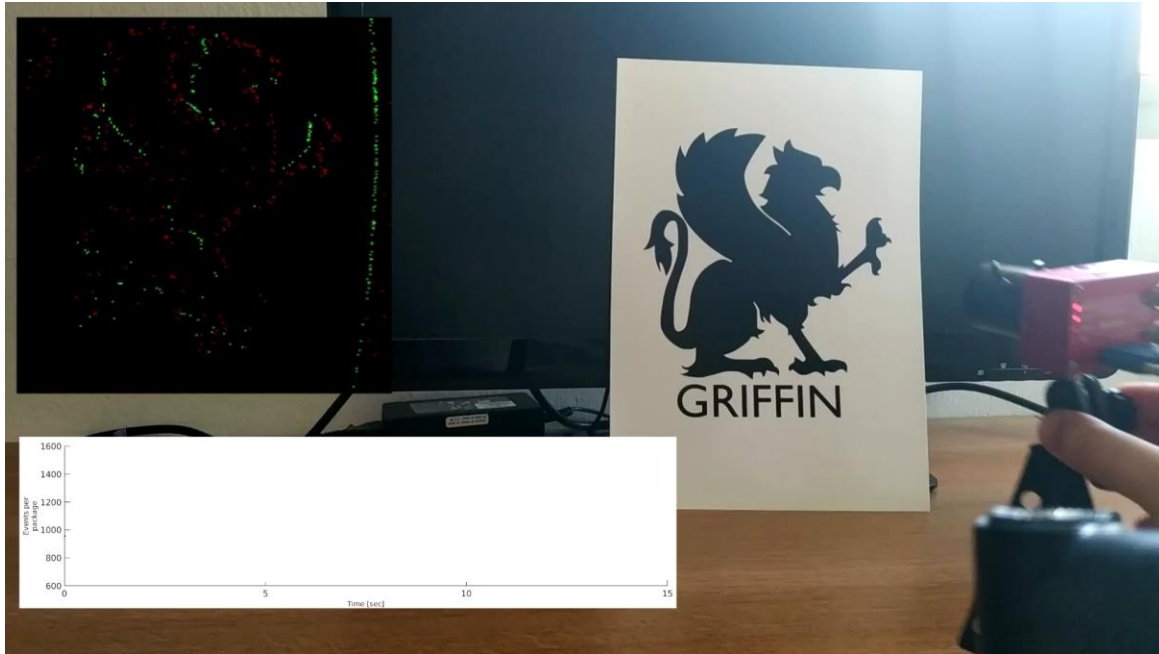


- Adapting to the environment (i.e. event generation).
- Adapting to the event-based algorithm computational cost.
- Computing events as soon as possible.
- Preventing overflow.

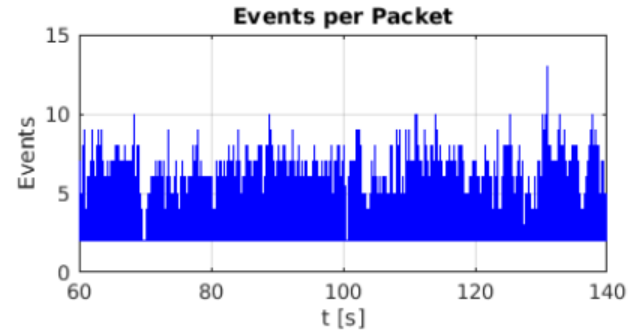
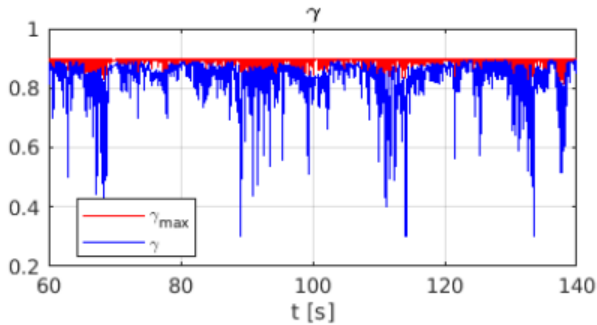
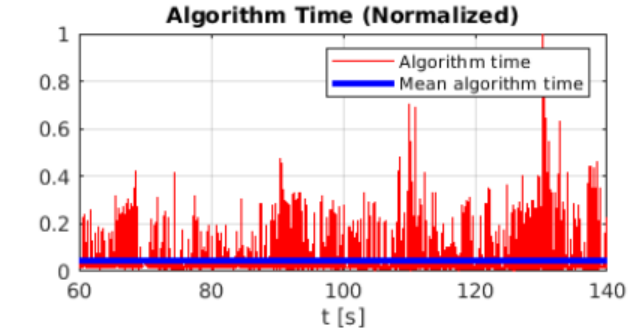
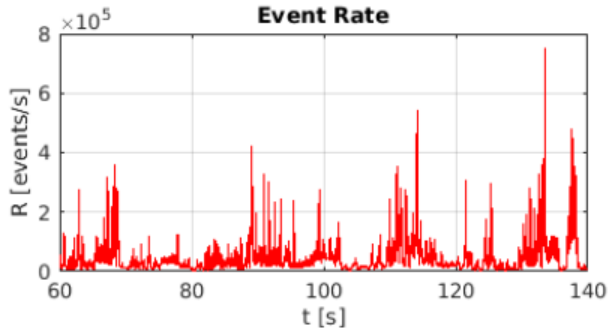
ASAP



Experimental Validation (I)



Experimental Validation (II)



Conclusions

- Adapting computational load → Responsiveness vs. overflow avoidance.
- Processing in low computing capacity devices (e.g. on-board computers).
- Processing in operations with high event generation (e.g. perching).



Advanced
Grant

Future work

- Integration on-board the ornithopter.
 - Probably not in the 1st iteration.
- Paper for a journal special issue + open source ASAP release.