

# MultiDrone Datasets

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**Version 2.5**

# MultiDrone datasets

- 36 UAV video datasets have been created/assembled within the MULTIDRONE H2020 project.
- Approximate total size: 260 GBs. **To be found in:**

[http://www.aiia.csd.auth.gr/LAB\\_PROJECTS/MULTIDRONE/AUTH\\_MULTIDRONE\\_Dataset.html](http://www.aiia.csd.auth.gr/LAB_PROJECTS/MULTIDRONE/AUTH_MULTIDRONE_Dataset.html)

<https://multidrone.eu/>

- They are partitioned into two subsets: datasets provided by AUTH and datasets provided by RAI or Deutsche Welle.
- In order to access the desired dataset subset, please complete and sign the corresponding license agreement found in the web page, i.e., from AUTH or from RAI. Subsequently, email it to Prof. Ioannis Pitas (Aristotle University of Thessaloniki, AUTH) or to Dr. Alberto Messina (RAI), so as to receive the relevant FTP credentials for downloading.
- NOTE: For datasets assembled from Youtube videos, only links to the videos and the relevant annotation files, if any, are provided.

# MultiDrone datasets

- If one uses any part of these datasets in his/her work, he is kindly asked to cite the following papers:
  - I. Mademlis, V. Mygdalis, N.Nikolaidis, M. Montagnuolo, F. Negro, A. Messina and I.Pitas, "High-Level Multiple-UAV Cinematography Tools for Covering Outdoor Events", IEEE Transactions on Broadcasting, vol. 65, no. 3, pp. 627-635, 2019.
  - I. Mademlis, N.Nikolaidis, A.Tefas, I.Pitas, T. Wagner and A. Messina, "Autonomous UAV Cinematography: A Tutorial and a Formalized Shot-Type Taxonomy", ACM Computing Surveys, vol. 52, issue 5, pp. 105:1-105:33, 2019.

# MultiDrone datasets

## AUTH datasets

# MultiDrone datasets

- **DCROWD\_VID**

- A dataset for visual human crowd detection was assembled from Youtube videos, licensed mainly under Standard Youtube License.
- It is a collection of 53 videos selected by querying the Youtube search engine with specific keywords describing crowded events (e.g., parade, festival, marathon, protests).
- Non-crowded videos have also been gathered by searching for unspecified drone videos.

# MultiDrone datasets

- **SHOT\_TYPES**

- A dataset containing 46 professional and semi-professional UAV videos was assembled from Youtube material.
- Care was taken to include as many UAV framing shot types and UAV/camera motion types as possible, based on the UAV shot type taxonomy defined in the context of the MULTIDRONE project.

# MultiDrone datasets

- **Annotations\_boats\_Raw**

A dataset for boat detection/tracking was assembled, consisting of 13 Youtube videos (resolution: 1280 × 720) at 25 frames per second. Annotations are not exhaustive, i.e. there may be unannotated objects in the given image frames.



# MultiDrone datasets

- **Annotations\_Bicycles\_Raw**

- A dataset for bicycle detection/tracking was assembled, consisting of 7 Youtube videos (resolution: 1280 × 1080) at 25 frames per second.
- Annotations are not exhaustive, i.e., there may be unannotated objects in the given video frames.



# MultiDrone datasets

- **Benchmark\_RAI**

- A dataset for bicycle detection/tracking was prepared by processing/editing and annotating material made available by RAI under the “Giro 2017” MULTIDRONE dataset.
- It is a dataset consisting of two videos (resolutions:  $768 \times 432$  and  $960 \times 540$ ) at 25 frames per second. The videos are from Giro d’Italia TV coverage provided by RAI.
- Annotations are exhaustive, i.e., all objects of a certain class present in a given image are covered by an annotation.

# MultiDrone datasets

- **person\_detection\_UA  
V**
- A visual person detection dataset has been prepared, consisting of two UHD videos at 25 frames per second.
- The camera was mounted on a DJI Phantom IV UAV and pointed towards the ground.
- Total video duration is 4 minutes and 20 seconds.



# MultiDrone datasets

- **AUTHDroneSunday\_  
VID**
- A dataset for visual human crowd detection was collected, in the form of 6 videos shot inside the AUTH Campus using a DJI Phantom IV UAV.
- UHD 20160p, 25 frames per second.
- Total video duration is 4 minutes and 20 seconds.



# MultiDrone datasets

- **UAV\_Detection**

- A dataset was prepared by AUTH for visual drone detection.
- 12 Full HD videos filmed using two cameras.
- The drone is shot against various backgrounds
- Total video duration is 31 minutes.



# MultiDrone datasets

- **UAV\_Detection\_2**
- A dataset for drone detection was collected using one camera held by a person on the ground, within AUTH campus.
- 11 Full HD videos were produced, which contain shots of a DJI Phantom IV
- Total duration of this dataset is 15 minutes, or about 22K frames at 25fps.



# MultiDrone datasets

- **Landing\_sites**
- A dataset of videos depicting potential UAV landing sites has also been captured.
- It consists of 2 videos captured by a DJI Phantom IV within AUTH campus, containing potential landing sites around a point of interest (POI), or generally in the university campus.



# MultiDrone datasets

- **AUTHObservatory\_VID**
- A dataset named “AUTHObservatory\_VID” was also collected by AUTH for building/Point-of-Interest detection purposes.
- It consists in two videos, containing the building of the AUTH observatory with the telescope dome.
- UHD 2160p, 25 frames per second.



# MultiDrone datasets

- **face\_deid\_UAV**
- A dataset for face de-identification consists of one  $3840 \times 2160$  video, which was shot by flying a DJI Phantom IV.
- The total video duration is 45 seconds with a framerate of 25 fps.
- Each face in the 1124 extracted frames is annotated with a bounding box.





# MultiDrone datasets

- **face\_deidentification\_UAV\_multiple\_views**
- A multiview dataset for face de-identification purposes was collected by a DJI Phantom IV UAV and consists of one  $4096 \times 2160$  video.
- The subjects were recorded from multiple viewpoints while walking-by.
- Total duration: 2 minutes and 23 seconds, at a framerate of 25 fps.



# MultiDrone datasets

- **Annotations\_eights\_D  
W\_raw**
- A dataset for boat detection/tracking was created, using footage from DW, consisting of 3 videos (resolution: 1280 x 720) subsampled at 25 frames per second.
- An annotation file is included along with each video file.



# MultiDrone datasets

- **Aerial\_Crowd\_Auth**

- An aerial crowd detection dataset was created by annotating videos captured by two different RGB cameras (olympus, sony) placed ~10m over the ground, recording a human crowd from different viewing angles.
- The videos were partially annotated, resulting in 563 1920x1080 RGB images along with their segmentation maps, which consist of two classes ('crowd', 'non-crowd').
- The segmentation maps are available as .png images, where pixels belonging in the 'crowd' class are in red color, while 'non-crowd' class pixels are in black



# MultiDrone datasets

- **Multiview\_Synthetic\_UAV**

- This dataset contains sequences generated by simulating 3 camera-equipped UAVs flying simultaneously under specific UAV/camera motion types (CMTs) and framing shot types (FSTs), while filming a simulated bicycle race.
- Each sequence may include up to 10 cyclists, differing only in the color of their jerseys. The UAVs fly in a 3-UAV ORBIT setup, a 2-UAV CHASE plus 1-UAV VTS and a 3-UAV TRACK setups, according to the MULTIDRONE UAV shot type taxonomy.
- The Unreal Engine 4-based AirSim simulation environment was employed for constructing the sequences.
- The evaluation dataset contains more than 90000 video frames, at a resolution of 640 x 360 pixels and a framerate of 25 FPS, while each video is more than 6.5 minutes long.
- Temporally synchronized ground-truth is provided for all camera parameters, 3D target positions and the corresponding 2D bounding boxes across all sequences.



# MultiDrone datasets

- **UAV\_Parkour**

- A UAV dataset for parkour athlete detection was assembled from 8 Youtube videos, depicting both male and female athletes performing parkour at different landscapes, under different lighting conditions.

# MultiDrone datasets

- **Final\_bicycles**

- A dataset for bicycle detection/tracking was created, consisting of 6 HD videos, at 50 or 25 frames per second. An annotation file is included along with each video file.

# MultiDrone datasets

- **Final\_boats**

- A dataset for rowing boat detection/tracking was created, consisting of 5 HD videos, at 50 or 25 frames per second. An annotation file is included along with each video file.

# MultiDrone datasets

- **Final\_single\_boats**

- A dataset for single boat detection/tracking was created, consisting of 5 HD videos, at 50 or 25 frames per second. An annotation file is included along with each video file.



# MultiDrone datasets

- **UAV\_BothKamp**

- A UAV dataset for parkour athlete detection was created by annotating the footage acquired during MULTIDRONE experimental media production.
- It consists of 6 videos (1920 - 1080) at 50 frames per second.
- The annotations provided are not exhaustive, i.e., there may be unannotated objects in some video frames.

# MultiDrone datasets

- **UAV\_Crowd\_Seville**

- A UAV crowd detection dataset was created by annotating videos captured by three different operating UAV cameras.
- The videos were partially annotated, resulting in 603 1920x1080 RGB images along with their segmentation maps, which consist of two classes (crowd, non-crowd).
- The ground-truth segmentation maps are available as .png images, where pixels belonging in the 'crowd' class are in red color, while 'non-crowd' class pixels are in black color.

# MultiDrone datasets

- **Multiview\_Boats\_Bothcamp**

- This dataset depicts a sample of a rowing race with three row boats in Bothkamp, Germany (September 2019).
- The footage was captured at 50 FPS and at a resolution of 1920x1080, using two UAVs filming simultaneously from different positions and view angles.
- The footage from the two UAVs is contained in two separate RGB video files, losslessly compressed with the Lagarith codec. No annotation is currently available.

# MultiDrone datasets

## RAI/DW datasets

# MultiDrone datasets

- **IGA\_2017**
- The footage was taken during the International Horticultural Exhibition (IGA) in Berlin, June 2017. The drone used was a Mavic Pro, parts of the footage has been published on Deutsche Welle's Internet format 'Daily Drone' <https://www.youtube.com/watch?v=MBgjr3ua554>.

# MultiDrone datasets

- **WUENSDORF\_2017**
- The footage showing a former Soviet base in the Federal State of Brandenburg, Germany, was shot with one Inspire 2 and one Mavic Pro (July 2017). The footage was used to create another Daily Drone clip <https://www.youtube.com/watch?v=IlwQmGsXTNs>. It shows the remains of the Soviet barracks and a Lenin statue.

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- **MUENCHEBERG\_2017**

- The footage was taken in Muencheberg, Brandenburg, Germany, in October 2017, using one Inspire 2 and one Mavic Pro. In total, 29 clips were produced focusing on the MULTIDRONE Camera Motion Types taxonomy. The dataset includes the clips and the associated flight records.

# MultiDrone datasets

- **MUENCHEBERG\_2018**

- One Inspire 2, one Mavic Pro and one Phantom 4 were used by a Deutsche Welle team to film a group of cyclists simulating a bicycle race, in Muencheberg, Brandenburg, Germany, during May 2018.
- The shoot was accompanied by colleagues from the University of Bristol who created simulations of such a bike race prior to the actual shooting.
- The parameters of these simulations such as flight altitude, camera angle, etc., were used during the recording of the race. Flight records are provided.



# MultiDrone datasets

- **NAUEN\_2018**
- One football player and one cyclist were filmed with one Inspire 2 and one Mavic Pro in Nauen, Germany, during April 2018.
- The shooting focussed on a subset of the UAV Camera Motion Types identified in the MULTIDRONE UAV shot type taxonomy (Lateral Tracking Shot, Vertical Tracking Shot, Pedestal/Elevator Shot With Target, Chase/Follow Shot, Orbit).
- The dataset contains 19 clips and their associated flight records.

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- **GIRO\_2017**
- This dataset consists of 9 clips taken from 2017 edition of the Giro d'Italia at 1920x1080 resolution and MP4 format at 25 frames per second.

# MultiDrone datasets

- **GIRO\_2018**
- This dataset consists of 26 clips taken from 2018 edition of the Giro d'Italia at 1920x1080 resolution and MP4 format at 25 frames per second.

# MultiDrone datasets

- **ARCHIVE\_2018**
- This dataset consists in 36 clips taken from RAI archives and depicting various shots of bikers, football players, boat racers and other additional outdoor sports (ski, sailing).
- Resolution is varying from 720x576 to 19020x1080 depending on the stored copy in the archive.

# MultiDrone datasets

- **METEORA\_2018**

- This dataset contains UAV footage filmed for Deutsche Welle's "Euromaxx – Lifestyle in Europe", in the mountains of Meteora, Greece, in August 2018.
- The footage mainly depicts rock climbing and it was shot using two drone models (a Mavic Air and an Inspire 2), as well as a variety of different shot perspectives, movements and angles.

# MultiDrone datasets

- **WANNSEE\_2018**

- This dataset contains UAV footage filmed by a Deutsche Welle team during the live rowing regatta "Rund um Wannsee" of 2018, one of the longest races in the world, set in the southwest of Berlin.
- Two drone teams were set along the track, a third drone was used for aerial overview and two additional standard camera teams covered the rest.

# MultiDrone datasets

- **WANNSEE\_2018\_Test**
- This dataset contains UAV footage filmed by a Deutsche Welle team before the live rowing regatta "Rund um Wannsee" of 2018.
- Three drones were employed (an Inspire, a Mavic Air and a Mavic Pro), with flight records provided.

# MultiDrone datasets

- **CYCLISTS\_2019**
- This is a dataset depicting a bicycle race training session in northern Italy (May 2019).
- The footage was filmed by RAI, using a DJI Phantom UAV flying above the bikers.



# MultiDrone datasets

- **YOUTUBE\_Drone\_Footage**
- This is a dataset consisting in the list of links of roughly 10 hours of drone footage on YouTube on soccer, rowing and cycling.

# Q & A

**Thank you very much for your attention!**

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