Directory

1. Flight data statistics

2024/12/4 updated

Flight Scenario	Flight Count	UAV Configuration	Flight Duration	Dataset Proportion
FAFS	33	UavY	318.5mins	12.2%
FAVS	164	UavY,UavR,UavG	1741.4mins	60.7%
VAFS	32	UavY,UavR	293.5mins	11.8%
VAVS	27	UavY,UavR	271.1mins	10.0%
Random	14	UavY,UavR	140.1mins	5.1%
Multi-UAV	(25 pairs)	(UavR,UavY) (UavY,UavG)	(250.0mins)	/
Summary	271+	UavR,UavY,UavG	2764.6mins (46.1hours)	100%

2. File naming convention

<table>
<tr><td rowspan="2">File type</td><td colspan="3">File name</td><td rowspan="2">File content</td></tr>
<tr><td>Folder</td><td>Sub-Folder</td><td>File</td></tr>
<tr><td rowspan="3">Flight data</td><td rowspan="3">Scenarios name
1:FAFS
2:FAVS
3:VAFS
4:VAVS
5:Random</td><td rowspan="2">raw_data</td><td>[UAV color]_Wind_[Payload Parameter][Altitude Parameter][Speed Parameter]_[Flight Number].csv</td><td>Raw wind speed and wind angle data</td></tr>
<tr><td>[UAV color] _[Payload Parameter][Altitude Parameter][Speed Parameter]_date[MMDD HHMM]_b[Battery Code]_[Collector].csv</td><td>Raw flight data</td></tr>
<tr><td>Same as scenarios name</td><td>Uav[UAV color]_[Payload Parameter] Altitude Parameter][Speed Parameter]_[Flight Number].csv</td><td>Flight data combined wind speed and wind angle</td></tr>
<tr><td>Measured wind data</td><td>wind</td><td colspan="2">Uav[UAV color]_wind_[MMDDHHMM]_[Altitude].csv</td><td>Wind speed and wind angle collected by the drone hovering at set altitude</td></tr>
<tr><td rowspan="2">Route map</td><td rowspan="2">Route</td><td colspan="2">[Scenario Abbreviation]_R[Path Number].pdf</td><td>Actual site plan view of the reference trajectory</td></tr>
<tr><td colspan="2">[Scenario Abbreviation]_R[Path Number]_xyz.png</td><td>3D View of the reference trajectory</td></tr>
<tr><td>Flight info</td><td colspan="3">Flight_info.csv</td><td>Detail information of each flight data</td></tr>
<tr><td>Multi-UAV info</td><td colspan="3">Multi-Uav-infosheet.csv</td><td>Flight data within five minutes of interval and their takeoff times</td></tr>
</table>

3. Flight-info.csv content

Column name	Description	Data source
Data Dir	Directory path(Name corresponds to the flight scenario)	Parsed from raw flight data filename
Date time	Flight operation timestamp	Parsed from raw flight data filename
Route	Planned flight path	Parsed from raw flight data filename
FlightName	Name of the flight data file	Manually input
Uav	UAV used for the flight	Parsed from raw flight data filename
Length(s)	Elapsed flight time	Flight Data(difference between first and last "time" values)
BatteryName	Battery pack identifier	Parsed from raw flight data filename
BatteryCost	Energy consumption during flight	Calculated from flight file
AllPower	Total power consumption for operation	Calculated(Summed power values from flight file)
WindSpeed_station	Wind speed from the nearest weather station	https://weather.visualcrossing.com/VisualCrossingWebServices/rest/services/timeline/xian/[Querytime]?key=JZ3D4U96ZNFZU6CV6FK3NH88G&contentType=json&include=current API request
WindSpeed_test	Average measured wind speed	Calculated from the middle 50% of data in the wind file
AirPressure_station	Air pressure from the nearest weather station	https://weather.visualcrossing.com/VisualCrossingWebServices/rest/services/timeline/xian/[Query time]?key=JZ3D4U96ZNFZU6CV6FK3NH88G&contentType=json&include=current API request
AirPressure_test	Field measured air pressure	Parsed from flight file

Air Density	Air density	Calculated from station data
Temperature	Temperature from the nearest weather station	https://weather.visualcrossing.com/VisualCrossingWebServices/rest/services/timeline/xian/[Query time]?key=JZ3D4U96ZNFZU6CV6FK3NH88G&contentType=json&include=current API request
Weather	Weather observation from the nearest weather station	https://weather.visualcrossing.com/VisualCrossingWebServices/rest/services/timeline/xian/[Querytime]?key=JZ3D4U96ZNFZU6CV6FK3NH88G&contentType=json&include=current API request
Pick Man	Operator name	Manually input

4. Flight data content

Variable	Unit	Description	Data source
time	s	Time elapsed in flight.	rostopic:/mavros/imu/data
wind_speed	m/s	Wind speed relative to the drone flight.	HY-SA256 Anemometer USB Serial Port
wind_angle	deg	Wind angle relative to the directionof drone flight	HY-SA256 Anemometer USB Serial Port
air _pressure	pa	Realtime air pressure during flight.	rostopic:/mavros/imu/static_pressure
battery_voltage	v	System voltage measured immediately after the battery	rostopic:/mavros/battery
battery_current	A	System current measured immediately after the batter.	rostopic:/mavros/battery
battery remain	%	Remaining battery level.	rostopic:/mavros/battery
gps_x;y	m	Position relative to the takeoff	rostopic:/mavros/local_position/pose

		point	
gps_z	m	Altitude above the ground	rostopic:/mavros/local_position/pose
real_lat;_long	deg	Longitude/Latitude of the actual trajectory	rostopic:/mavros/global_position/raw/fix
aim_lat;_long	deg	Longitude/Latitude of the reference trajectory.	republic rostopic:/current_waypoint
o_x; _y;_ z;_w	quaternion	Aircraft orientation.	rostopic:/mavros/imu/data
v_x;_ y;_ z	m/s	Ground speed.	rostopic:/mavros/local_position/velocity_local
la_x; _y; _z	m/s2	Ground acceleration.	rostopic:/mavros/local_position/velocity_local
power	w	Uav battery output power	battery_voltage*battery_current

5. Multi-UAV_infosheet.csv content

Column Name	Description
Uav1	Name of the first UAV in the multi-UAV flight
Uav1_time	Take-off time of the first UAV
Uav2	Name of the second UAV in the multi-UAV flight
Uav2_time	Take-off time of the second UAV
Uav3	Name of the third UAV in the multi-UAV flight
Uav3_time	Take-off time of the third UAV

6. Collector name and email

Collector(Pick man)	Full name	Email	Organization
lmj or mj	Mengjie Lee	lmj1023@mail.nwpu.edu.cn	PhD candidates, Northwestern Polytechnical University
hfh	Fanghao Han	FhHan996@163.com	Master candidates, Northwestern Polytechnical University
ly	Yi Liu	roryliu@mail.nwpu.edu.cn	Master candidates, Northwestern Polytechnical University
rcc	Chuncheng Ran	rcc@mail.nwpu.edu.cn	Master candidates, Northwestern Polytechnical University
ltc	Tianci Li	2188342623 @qq.com	/