

DSTVis: Towards Better Visual Analysis of UAVs'

Spatio-temporal Data

– **Supplementary Material** –

This supplementary material provides additional information and results about the evaluation for our submitted paper titled DSTVis: Towards Better Visual Analysis of UAVs' Spatio-temporal Data.

This supplemental material includes a demonstration video and user research results, with data for visual analysis derived from the drone flight logs provided by Data Comets[1].

For the user study, we provide the post-study questionnaires and Research process photos.

Data Description

name	describe	uint	type
Roll Angular Rate Setpoint (Degs/s)	Desired quaternion for quaternion control		float32
Pitch Angular Rate Setpoint (Degs/s)	body angular rates in NED frame		float32
Yaw Angular Rate Setpoint (Degs/s)	body angular rates in NED frame		float32
Altitude Recorded (Meters)	Altitude in 1E-3 meters above MSL, (millimetres)		int32
Velocity (Meters/second)	GPS ground speed, (metres/sec)		float32
Noise (Per Meters/second)	GPS noise per millisecond		int32
Jamming Indicator	indicates jamming is occurring		int32
Altitude Estimated (Meters)	Altitude AMSL, (meters)		float32
Roll Angle Setpoint (Degs)	Quaternion rotation from NED earth frame to XYZ body frame		float32
Pitch Angle Setpoint (Degs)	Quaternion rotation from NED earth frame to XYZ body frame		float32
Yaw Angle Setpoint (Degs)	Desired quaternion for quaternion control		float32
Roll Angle Estimated (Degs)	Quaternion rotation from NED earth frame to XYZ body frame		float32
Pitch Angle Estimated (Degs)	Quaternion rotation from NED earth frame to XYZ body frame		float32
Yaw Angle Estimated (Degs)	Quaternion rotation from NED earth frame to XYZ body frame		float32
Roll Angular Rate Estimated (Degs/s)	Bias corrected angular velocity about X body axis in rad/s		float32
Pitch Angular Rate Estimated (Degs/s)	Bias corrected angular velocity about Y body axis in rad/s		float32
Yaw Angular Rate Estimated (Degs/s)	Bias corrected angular velocity about Z body axis in rad/s		float32
Barometer Altitude (Meters)	Altitude above MSL calculated from temperature compensated baro sensor data using an ISA corrected for sea level pressure SENS_BARO_QNH.		float32
Altitude Set Points (Meters)			float32
CPU Load (0 - 1)	float32 load		float32
Battery Remaining (0=Empty - 1=Full)	From 1 to 0, -1 if unknown	0-1	float32

Battery Current (Amps)	Battery current in amperes, filtered, 0 if unknown	amperes	float32
Battery Discharged (Milliamp Hours)	Discharged amount in mAh, -1 if unknown	mAh	float32
Thrust Control (0=no thrust - 1=max thrust)control throttle			float32
Roll Control (-1 - 1)	control roll	-1-1	float32
Pitch Control (-1 - 1)	control pitch	-1-1	float32
Yaw Control (-1 - 1)	control yaw	-1-1	float32

REFERENCES

[1] Saffo, D., Leventidis, A., Jain, T., Borkin, M.A. and Dunne, C. (2020), Data Comets: Designing a Visualization Tool for Analyzing Autonomous Aerial Vehicle Logs with Grounded Evaluation. Computer Graphics Forum, 39: 455-468. <https://doi.org/10.1111/cgf.13994>