

# Drone Log Visualization

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# Introduction

## Service Partner:

- Drone manufacturing
- Current applications
  - Monitoring the coast line
  - Recording military drills
  - Monitoring cross-border drug trafficking

## Service Partner: Needs A Log Analysis Tool

- Can analyze logs efficiently
- Better than their current tool



# Introduction

- Logs contain telemetries (T02, T15, ...)
- Data (mostly time series, quantitative)
  - Sensor data (compass, accelerometers, gyroscopes, GPS, ...)
  - System monitoring information (sensor errors, system errors, ... )
  - GCS-Autopilot communication information



Autopilot

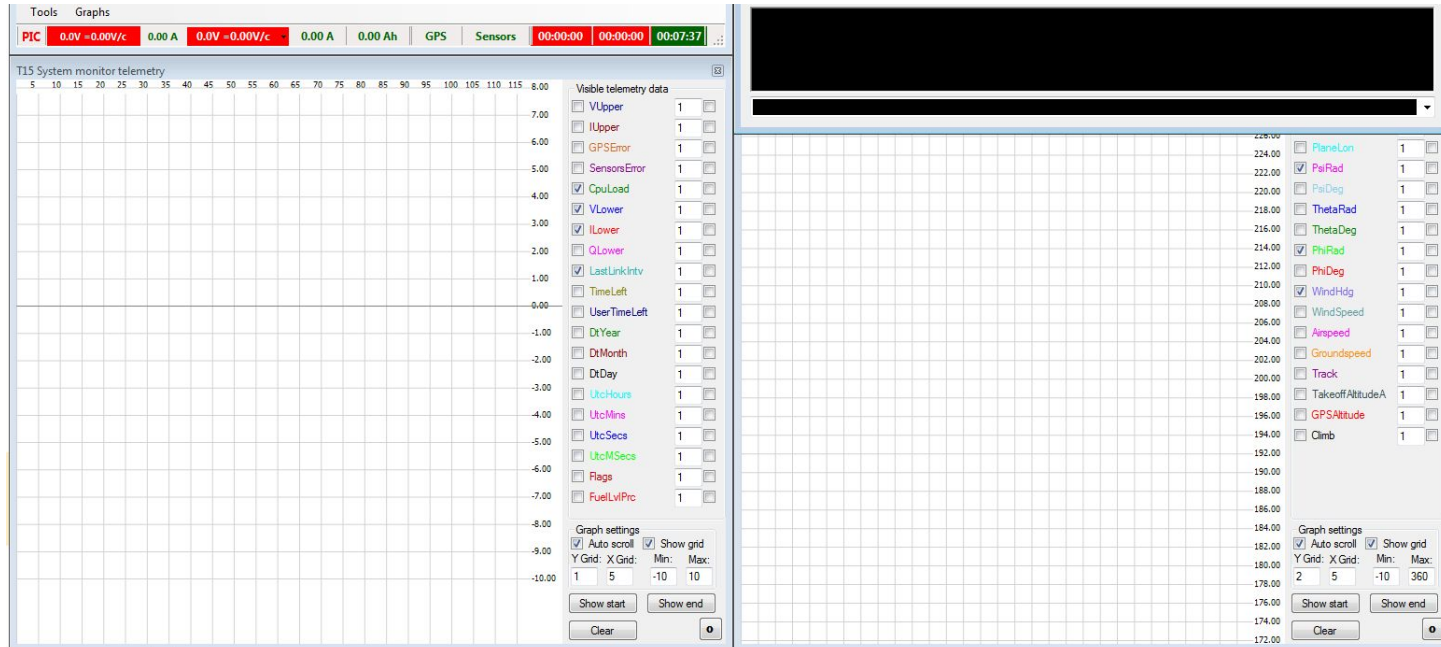


Ground Control Station



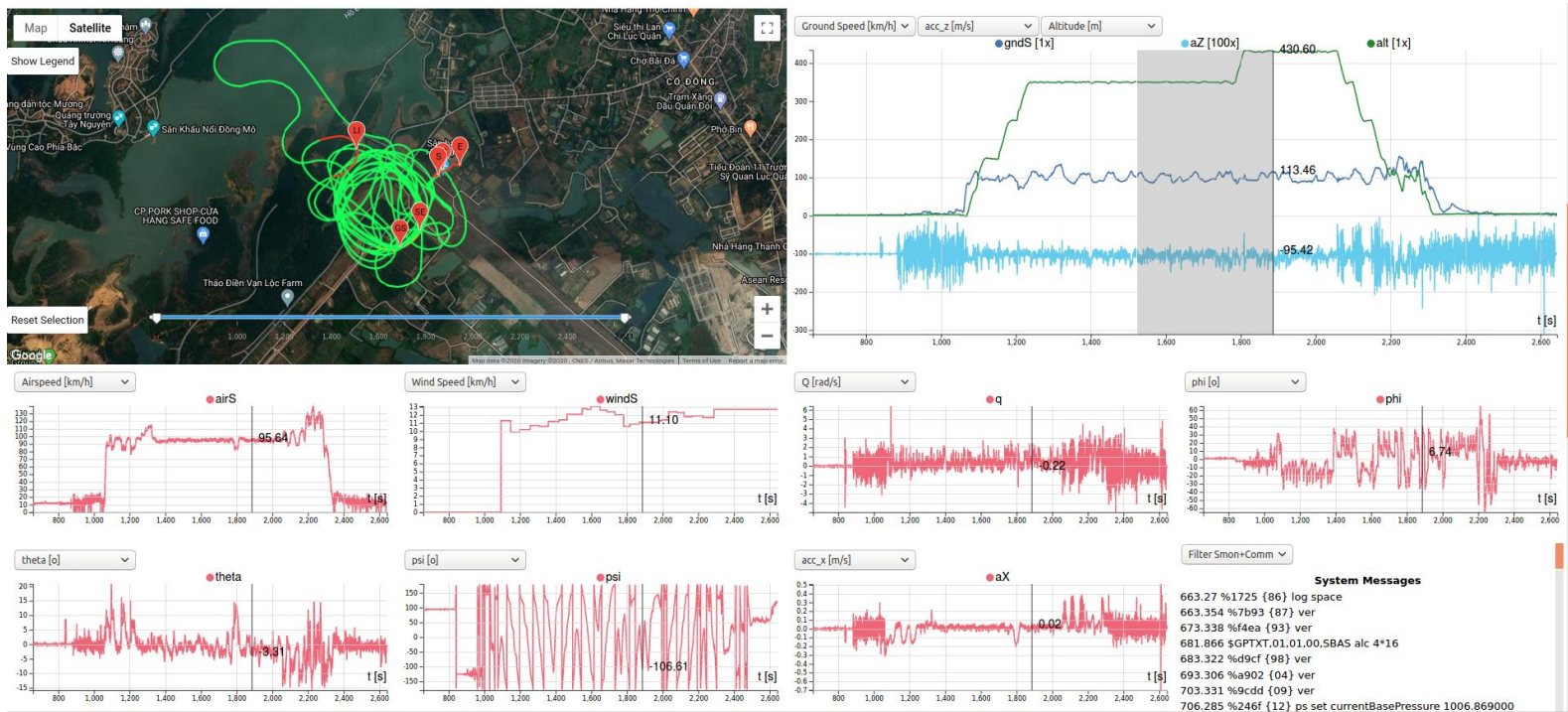
# Existing Tool

- Manually arranging windows
- Lots of window switching



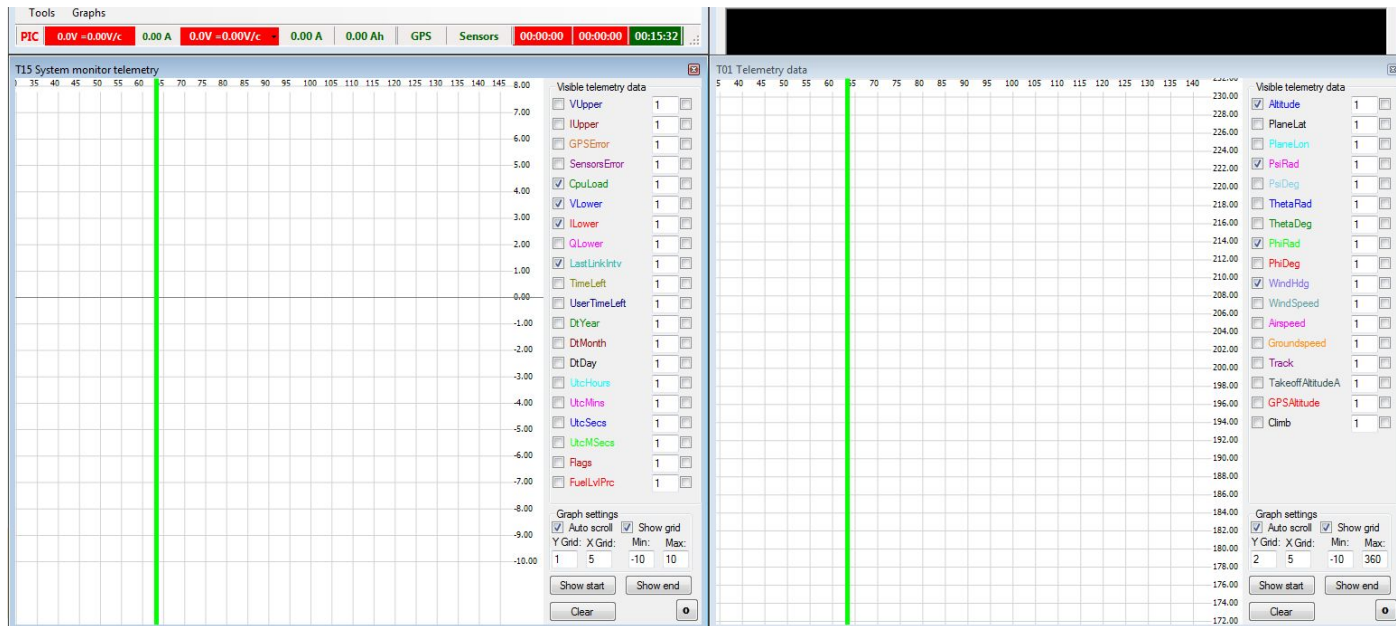
# Our tool.

- All components fit in a single page, no need to scroll
- Minimize window switching and reduce cognitive load



# Existing Tool

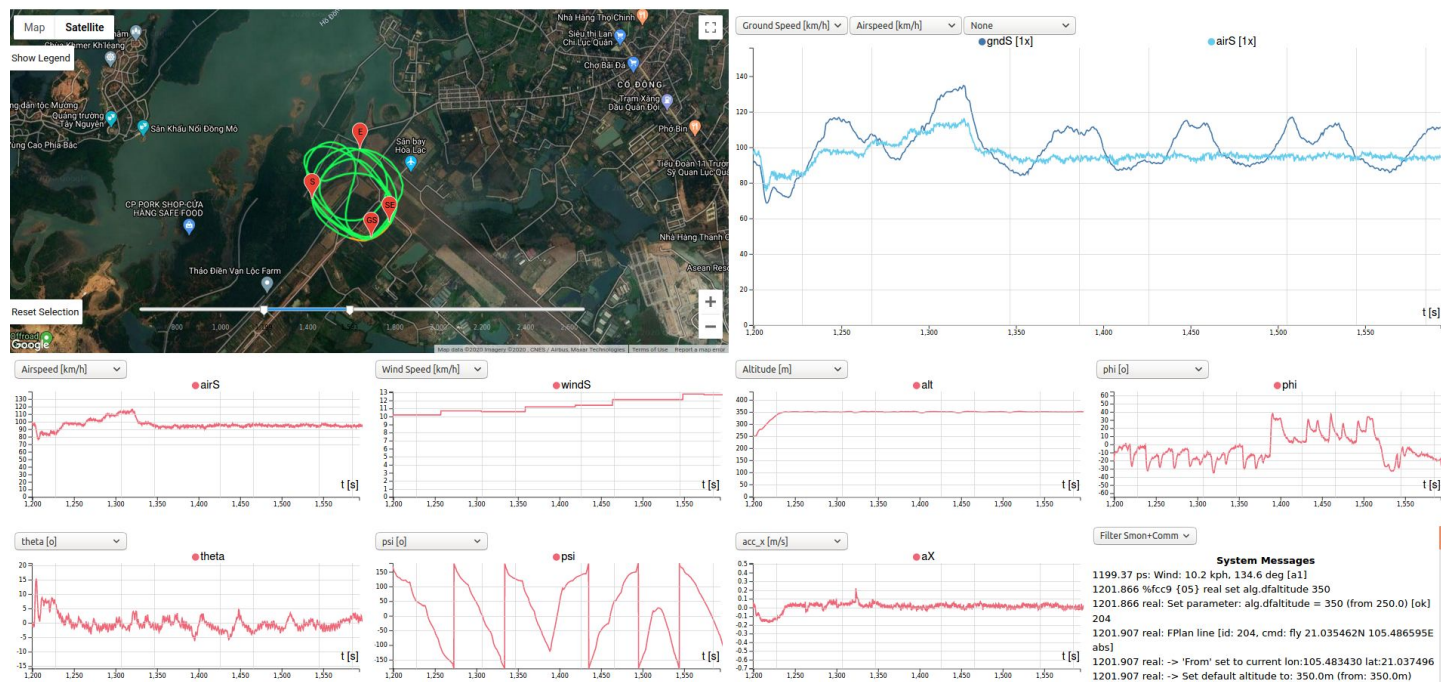
- Limited interactions
- Manually input scales for attributes





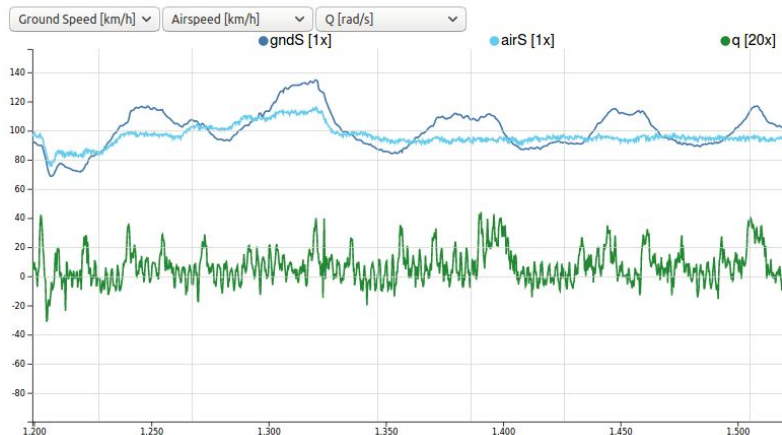
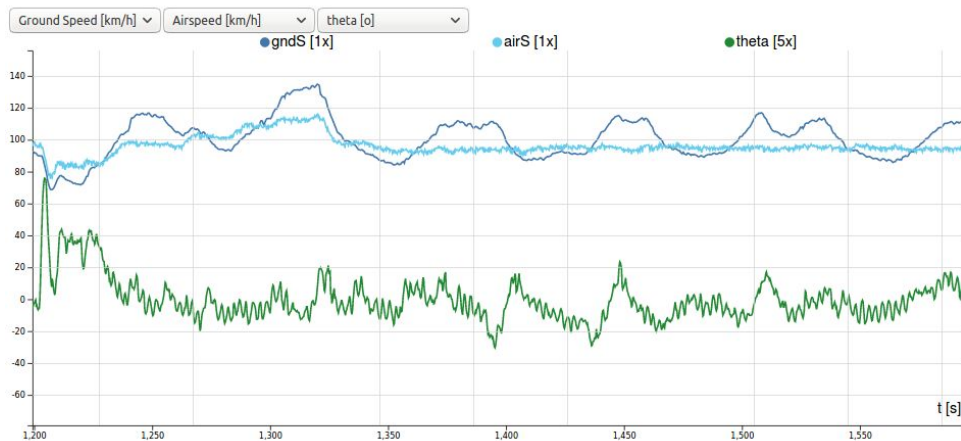
# Our Tool

- Linked selections



# Our Tool

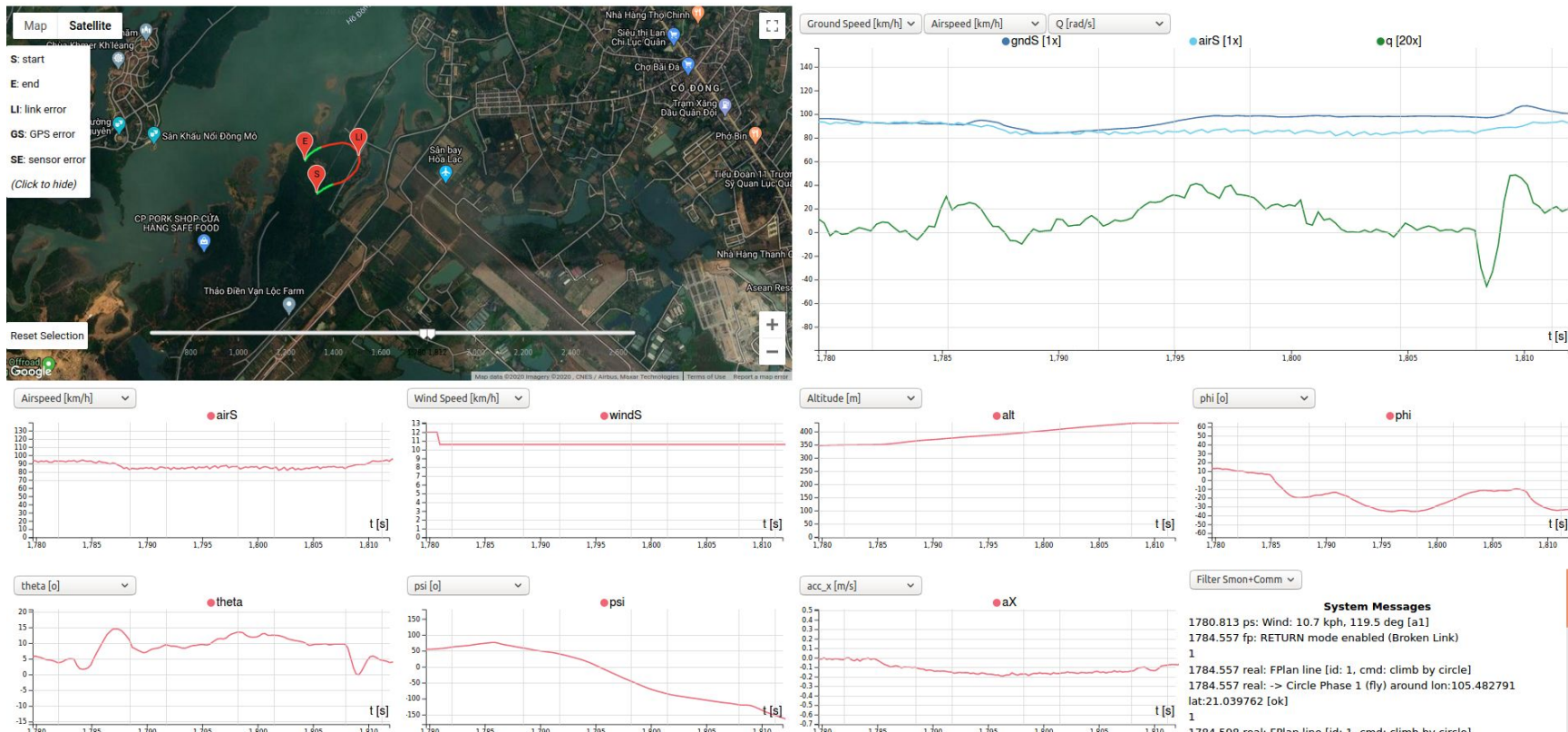
- Autonomous scaling: Scale attributes to display nicely





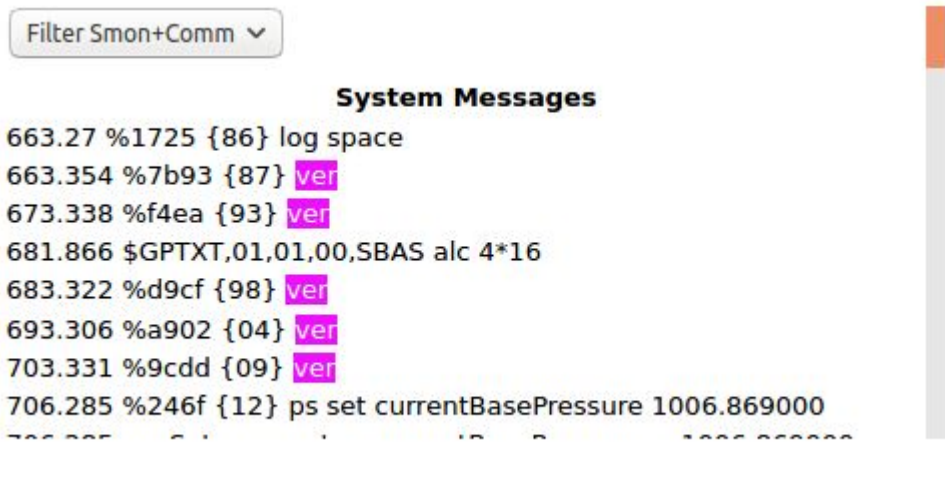
# Our Tool

- Autonomous analysis for potential anomalies



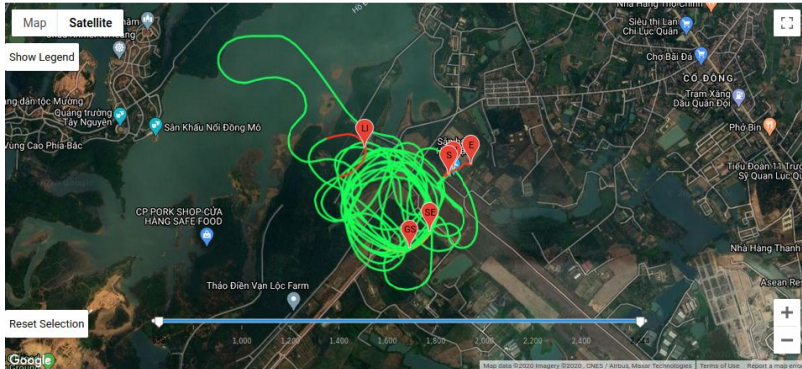
# Existing Tool vs. Our Tool

- Existing Tool: C#-based, required installation, only supports Windows
- Our Tool: Web-based can work on most OSe, treat system messages better



# Implementation

- We use Google APIs for the map
- D3.line and D3.dispatch for line charts and linking them
- Console textbox: simple HTML text box that is scrollable and searchable by default with filtering in the backend

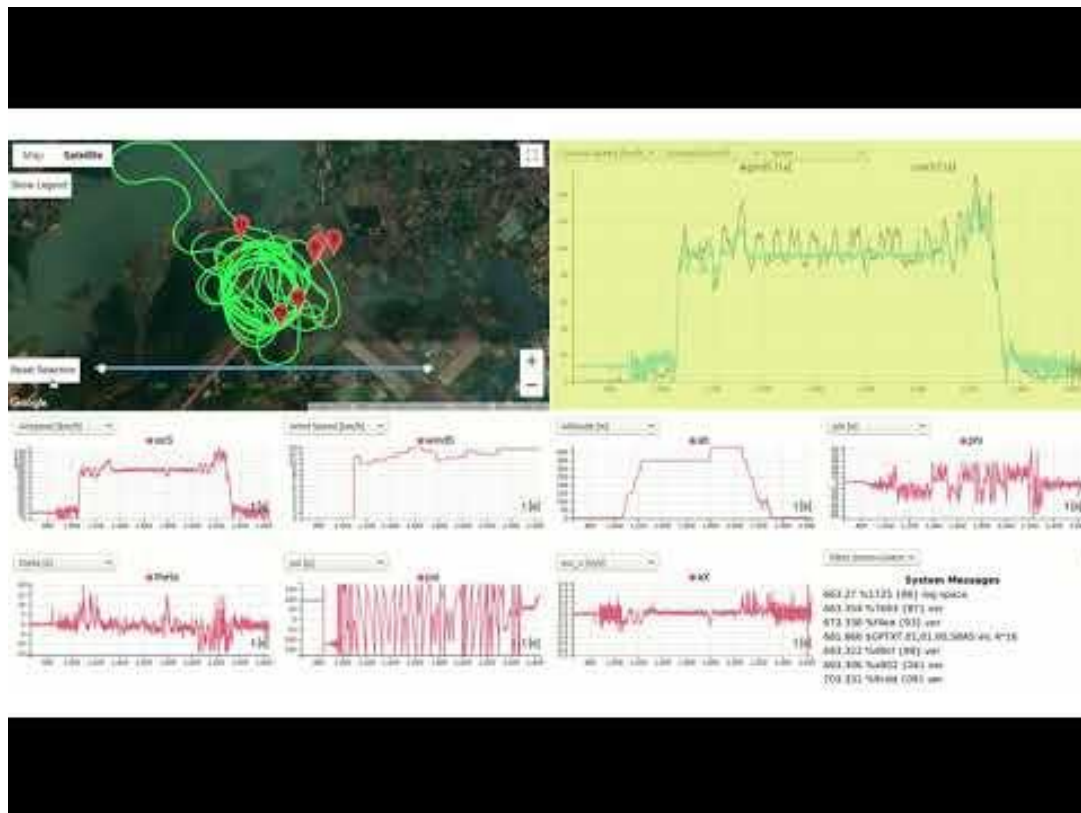


Filter Smon+Comm ▾

## System Messages

```
663.27 %1725 {86} log space
663.354 %7b93 {87} ver
673.338 %f4ea {93} ver
681.866 $GPTXT,01,01,00,SBAS alc 4*16
683.322 %d9cf {98} ver
693.306 %a902 {04} ver
703.331 %9cdd {09} ver
706.285 %246f {12} ps set currentBasePressure 1006.869000
706.285 %246f {12} ps set currentBasePressure 1006.869000
```

# Demo



# Conclusions

- Our tool can effectively show the flight path as well as the telemetry
- Compared to the existing tool, our tool offers several benefits
  - Information are displayed more intuitively
  - The map helps contextualize the telemetry data
  - The interactivity supports users better to find anomalies in logs

Questions?