How AI Saves a Drone from Jamming

Kirill | AI Solutions for High-Tech

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Imagine this: you're sitting in the morning with a cup of coffee, deciding to launch your drone for an important mission — perhaps delivering medical supplies across mountain passes or surveying terrain in challenging conditions. The weather is perfect: sunshine, a light breeze. The drone takes off confidently and heads out to complete its mission.

But suddenly — the signal is lost, coordinates start jumping, and alarming red notifications appear on the controller's screen. It seems like the aircraft has "gone deaf" and is no longer responding to commands.

Welcome to the signal jamming zone!

How to Avoid Disaster?

This is where our AI module comes to the rescue. It continuously monitors telemetry data and “understands” that something is wrong even before the

drone completely loses control.

Let me explain how we achieved this.

Drone Emulator with Basic Physics

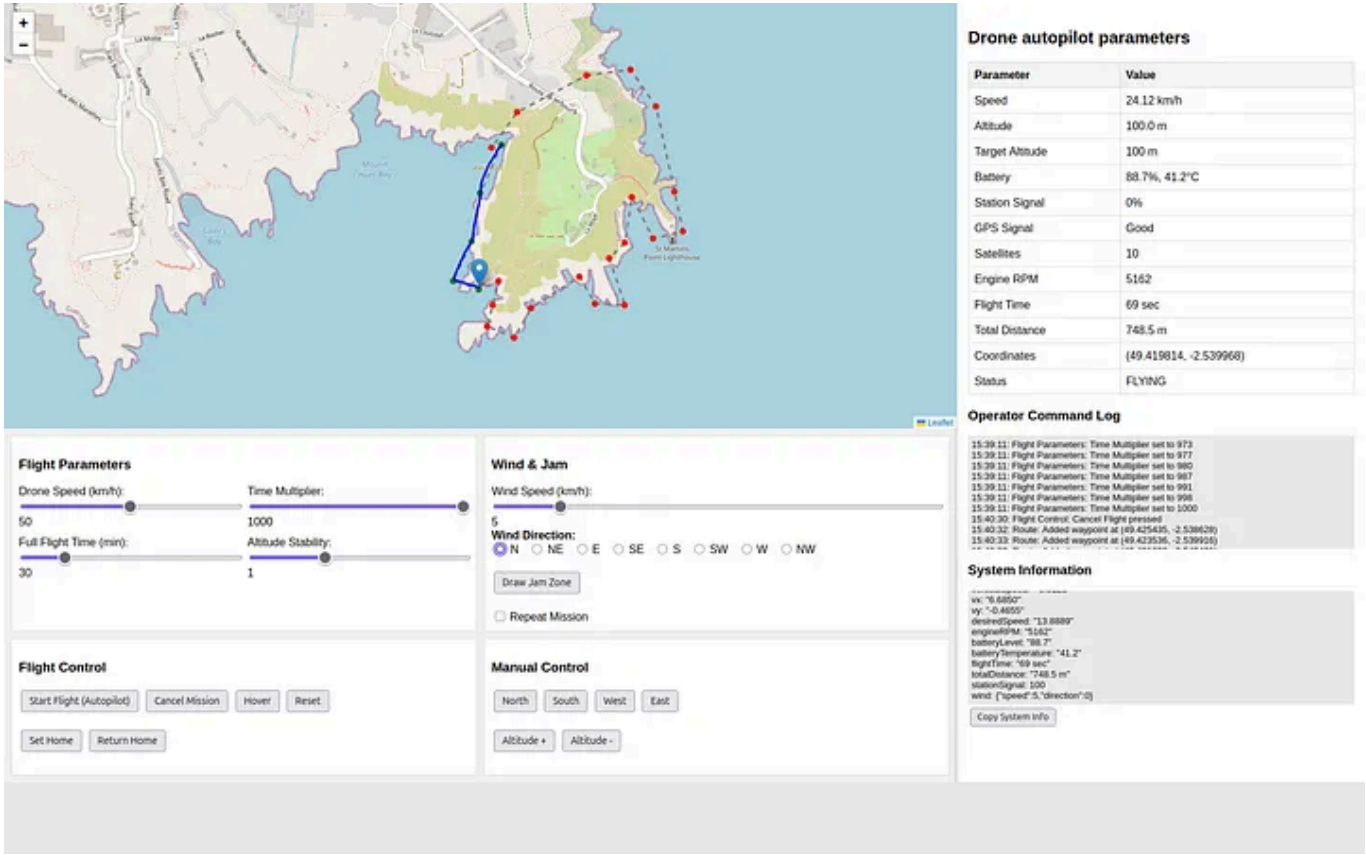
To train and test our system, we used a simplified flight emulator. It doesn't aim to perfectly replicate aerodynamic intricacies, but it provides everything necessary for debugging: virtual coordinates, speed, altitude, wind effects, and several other parameters.

The key point is that we derive our baseline data from a real **DJI Air 2S**, meaning we use actual flight logs:

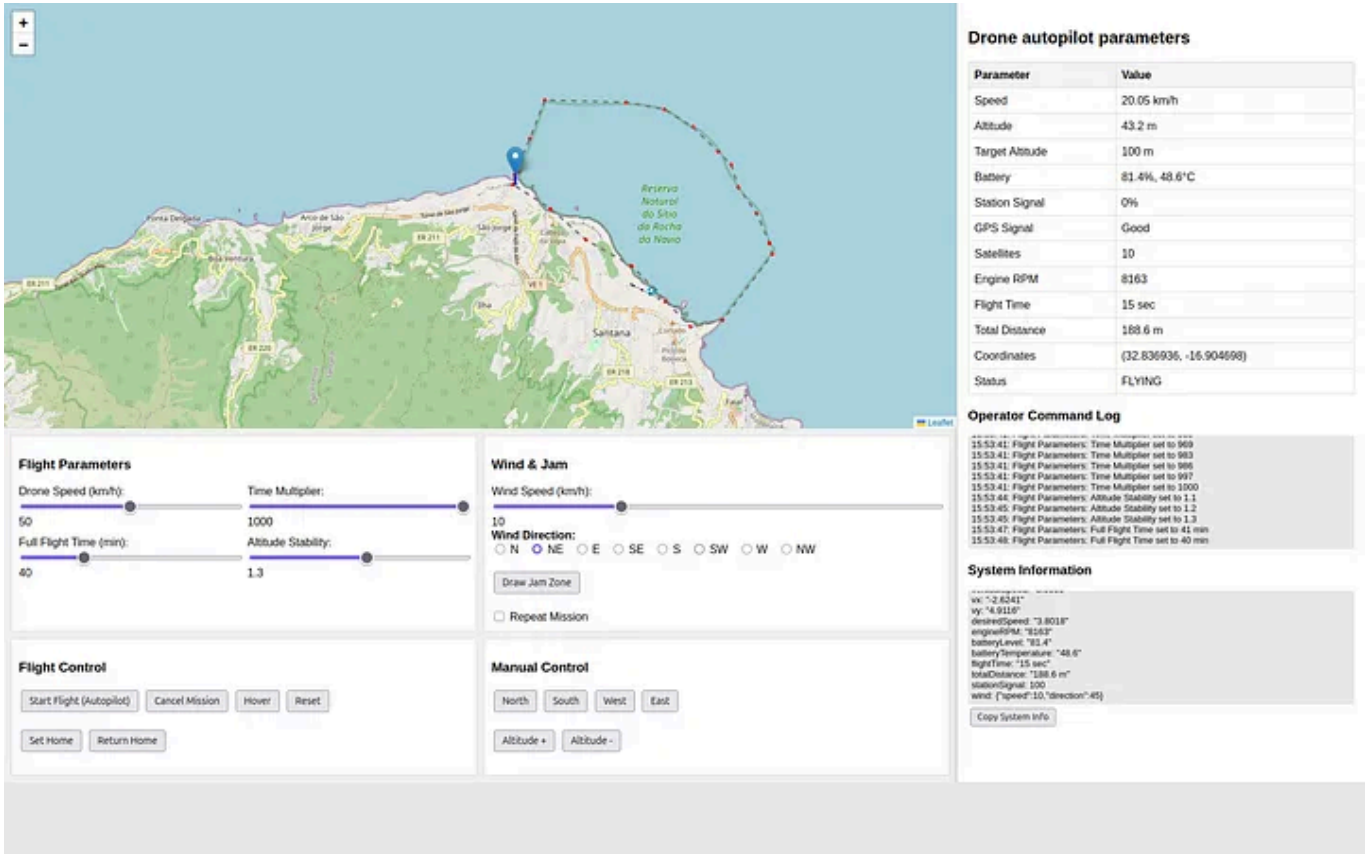
- **altitude**
- **verticalSpeed**
- **engineRPM**
- **batteryLevel** and **batteryTemperature**
- **flightTime** (total flight duration)
- **totalDistance** (distance traveled)

- **GPS signal** (number of satellites, signal quality)
- **gyro_x / gyro_y / gyro_z** (gyroscope readings)
- **accel_x / accel_y / accel_z** (accelerometer readings)
- … and many other metrics that operators often overlook.

All this data is fed into the emulator's engine, which then simulates the flight. The idea is simple: if our AI learns to recognize dangerous trends even in a simplified flight scenario, it will perform even better in real-world conditions.



Drone Flight Control Panel



Drone Flight Control Panel

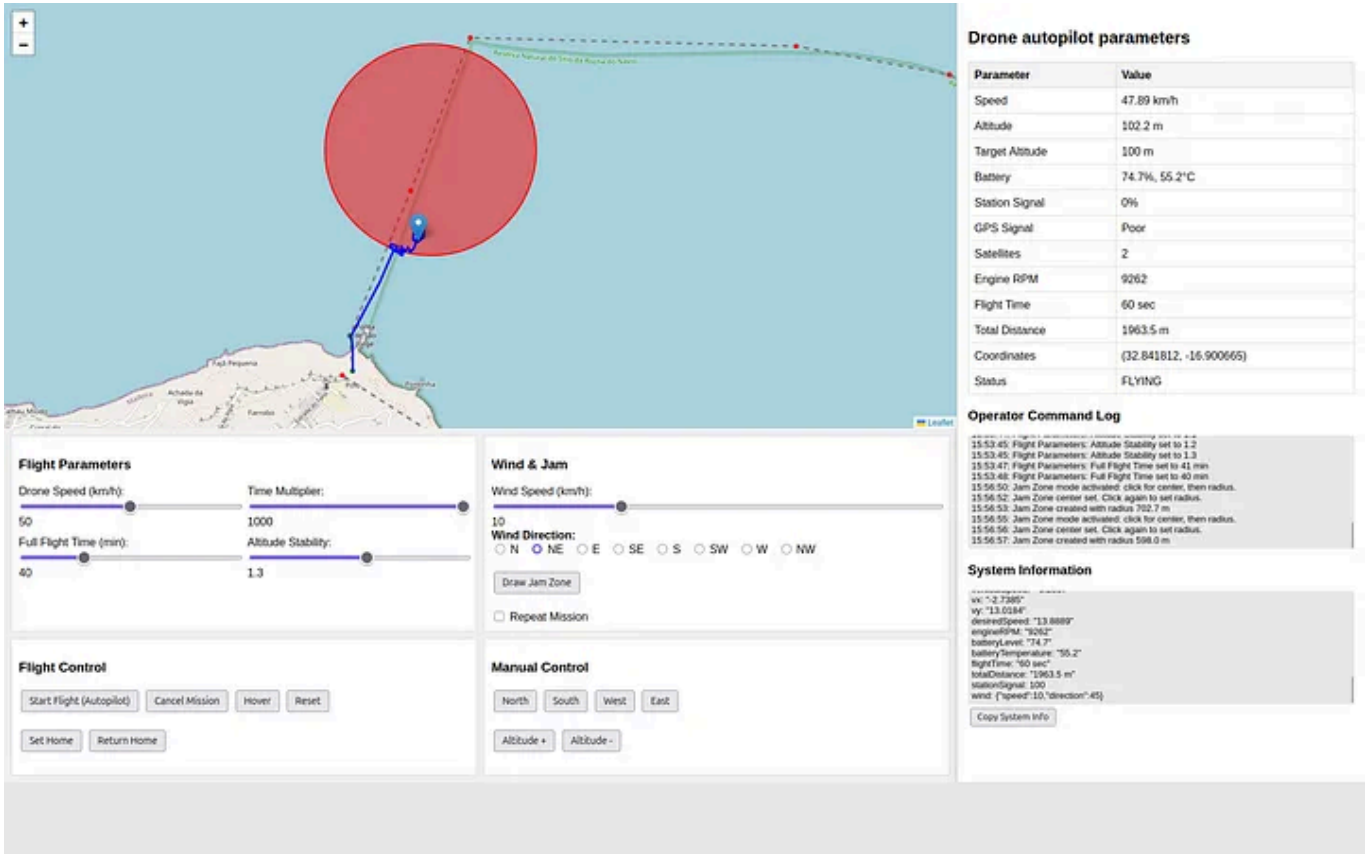
How AI “Senses” Jamming

The core principle is simple: our AI module continuously monitors the drone’s “pulse” by analyzing familiar parameters. However, instead of just passive monitoring, it interprets the data intelligently.

For example, if the GPS signal starts fluctuating erratically or the vertical speed shows sudden, unexplained jumps, something is clearly off in the air.

The system's job is to report this to the operator in plain human language. Instead of an abstract error code, the operator receives a clear message:

"It looks like we're experiencing strong radio interference. I recommend bringing the drone back or changing the route before it's too late."



Drone in jamming zone

Real-Time “Command Center”

All these signals are displayed on an intuitive dashboard, similar to an aircraft cockpit. It features multiple graphs and indicators:

- **Altitude line**, which should be smooth but may suddenly “spike” if the drone loses orientation.