

# UAV Toolbox Release Notes



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### *UAV Toolbox Release Notes*

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# R2020b

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**Version: 1.0**

**New Features**

## **UAV Scenarios and Sensor Models: Construct cuboid scenario and simulate sensor readings for UAV applications**

The `uavSensor` object generates a simulation scenario consisting of static meshes, UAV platforms, and sensors in a 3D environment. Add `uavPlatform` objects to the scenario and attach different sensor models with the `uavSensor` object.

The `uavPlatform` object represents an unmanned aerial vehicle (UAV) platform in a given UAV scenario. Use the platform to define and track the trajectory of an object in the scenario. To simulate sensor readings for the platform, mount sensors like the `gpsSensor`, `insSensor`, or `uavLidarPointCloudGenerator` objects with a set of `uavSensor` objects. Add a body mesh for visualization using `updateMesh`. Set geofencing limitations using `addGeoFence` and check those limits using `checkPermission`.

The `uavSensor` object creates a sensor that is rigidly attached to a UAV platform, specified as a `uavPlatform` object. You can specify different mounting positions and orientations. Configure this object to automatically generate readings from a sensor specified as an `insSensor`, `gpsSensor`, or `uavLidarPointCloudGenerator` object.

For an introduction to scenarios, see “UAV Scenario Tutorial”.

## **3D Simulation: Develop, test, and verify UAV algorithms in a 3D simulation environment rendered using the Unreal Engine from Epic Games**

UAV Toolbox provides a co-simulation framework that models driving algorithms in Simulink® and visualizes their performance in a virtual simulation environment. This environment uses the Unreal Engine® from Epic Games®.

For an introduction to 3D simulation, see “Unreal Engine Simulation for Unmanned Aerial Vehicles”.

## **Flight Log Analyzer App: Import and visualize autopilot flight log with pre-defined and customizable plots**

To analyze a log file and create a customized series of plots, use the **Flight Log Analyzer** app.

Flight logs for UAVs contain large amounts of data with many varying formats. Use the flight log analysis functions to load different telemetry log files including TLOG, ULOG, and custom file types. To extract and map signals from a telemetry log for generating plots, use the `flightLogSignalMapping` object.

For more information, see “Flight Log Analysis”.

## **UAV Motion Planning and Control: Design and simulate autonomous missions for fixed-wing and multirotor UAV with waypoint following, orbiting, and path management**

Plan and execute UAV flights using guidance motion models for fixed-wing and multirotor UAVs. Fly predefined missions using waypoint and trajectory following algorithms.

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For an example using an RRT path planner that plans and simulates a flight in a city setting, see “Motion Planning with RRT for Fixed-Wing UAV”.

For more information, see “Planning and Control”.

## **MAVLink Connectivity and Deployment: Communicate with UAV hardware using the MAVLink protocol and deploy to target hardware**

The Micro Air Vehicle Link (MAVLink) communication protocol is a message protocol for sending and receiving messages between UAVs. The protocol uses a publish-subscribe pattern for data streams with specified topics and message types. There are different sub-protocols for missions and parameters. Use the MAVLink supported functions or blocks to specify predefined or custom dialects, setup clients, and send or receive messages.

## **UAV Reference Application: Use a reference model to simulate and test UAV package delivery with obstacle avoidance**

For this reference application, see the “UAV Package Delivery” example.

## **UAV Toolbox Support Package for PX4 Autopilots: Build and deploy flight control algorithms to the Pixhawk Autopilot**

For more information, see “UAV Toolbox Support Package for PX4 Autopilots”.

