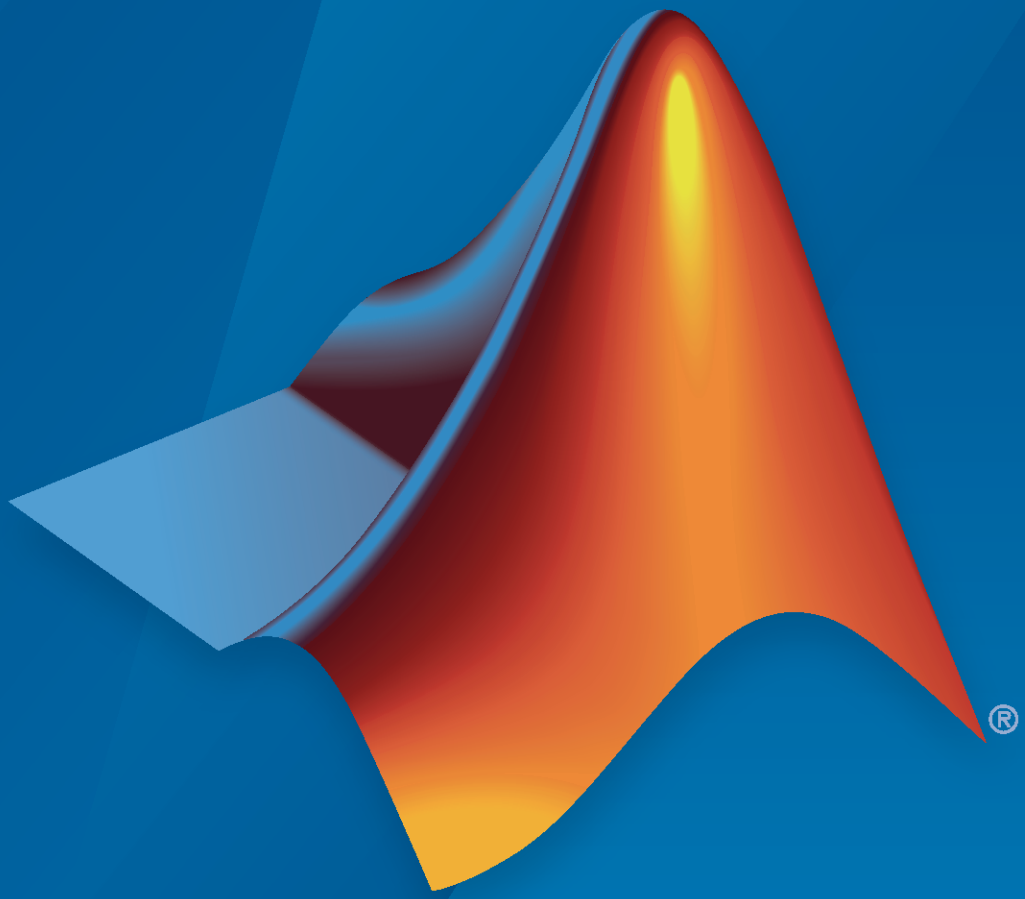
# UAV Toolbox Release Notes



MATLAB® & SIMULINK®

MathWorks®

# How to Contact MathWorks

Latest news: `www.mathworks.com`

Sales and services: `www.mathworks.com/sales_and_services`

User community: `www.mathworks.com/matlabcentral`

Technical support: `www.mathworks.com/support/contact_us`

Phone: 508-647-7000

The MathWorks, Inc.
1 Apple Hill Drive
Natick, MA 01760-2098

*UAV Toolbox Release Notes*

# Contents

## R2021a



## R2020b

# R2021a

**Version: 1.1**

**New Features**

## Terrain and Mesh Support in UAV Scenarios: Add DTED terrain data or meshes to simulated UAV scenarios

Load digital terrain elevation data (DTED) using the `addCustomTerrain` function, and add the terrain to the UAV scenario using the `addMesh` function.

To specify complex mesh objects as triangulated vertices and faces, use the `extendedObjectMesh` object. Add the mesh to UAV scenarios using the `addMesh` function.

## Custom Sensor Support in UAV Scenarios: Add custom sensor models to UAVs in simulated scenarios

Specify custom sensor models and define their behavior in simulation using the `uav.SensorAdapter` class. To generate a template for implementing the class, use the `createCustomSensorTemplate` function.

## Flight Log Analyzer Update on Signal Export: Export signals as timetables to the MATLAB workspace or a MAT-file

The **Flight Log Analyzer** app now enables you to export signals as timetables to the MATLAB workspace or a MAT-file. To export signals, select **Export** > **Export Signal**. In the **Export Signal** dialog box, select the listed signals you want to export, select the export format, and click **Export**.

## Flight Log Signal Mapping Object Update: Check mapped signals using flight log data

Use the `checkSignal` object function of the `flightLogSignalMapping` object to verify mapped signals using the flight log data.

## Unreal Engine Scene Environment: Control weather and sun position

Use the Simulation 3D Scene Configuration block to control scene weather and sun position. Options allow you to create realistic environments when you run maneuvers and test control algorithms in the Unreal Engine® 3D simulation environment. The Simulation 3D Camera and Simulation 3D Fisheye Camera blocks receive the image from the 3D simulation environment.

To control scene weather and sun position, on the Simulation 3D Scene Configuration block **Weather** tab, select **Override scene weather**. Use the enabled parameters to change the sun position, clouds, fog, and rain during the simulation.

# R2020b

**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.

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.