# SkyDrones SDK DJI CASES


SkyDrones
The sky is not our limit.

# Who is SkyDrones ?

Since 2008, SkyDrones has developed solutions for obtaining automated data and information using aerial Drone technology.

We Operate in the Inspection, Mapping, Search and Rescue, Security and Agriculture markets.

In addition to having an experienced and qualified technical team from the aerospace industry, we distribute major brands in Brazil and have technological partnerships in several countries, such as the United States, Germany and China.

**We have already been invited to speak at important companies about our development work using the DJI platform and its SDK:**

## SAP

April/2018


## GOOGLE

May/2018

# SkyDrones Customer Development Cases

SkyDrones App

Strix-Ag

Strix-T1020

SARtube

SkyPatrol

SmartUAV

A.I. Navigation

Agriculture

# Project App SkyDrones

2016/1

**Customer:** DJI Mapping Users

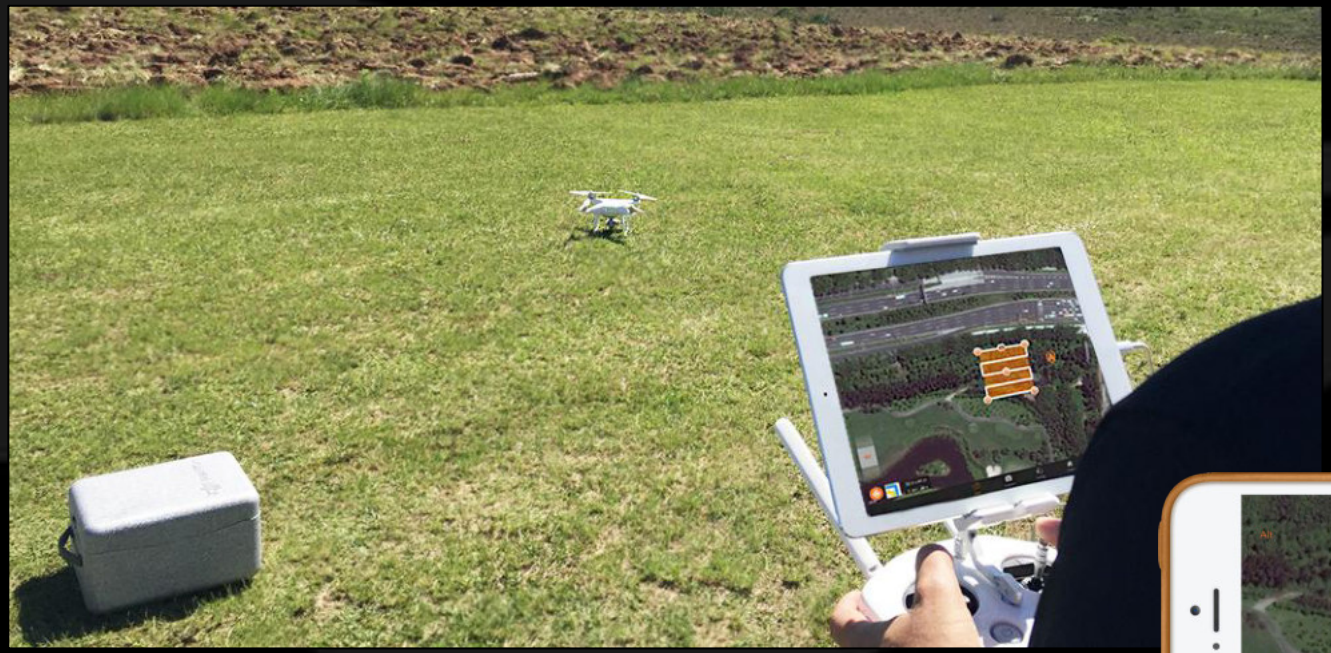
- **Customer Objective:**
  Carry out automatic flight plans for mappings using DJI products. It is a practical app in Portuguese, English and German.

- **Abstract:**
  Create a free mobile app to meet the market mapping demand for iOS and Android.

- **Status:**
  Active.

# Project App SkyDrones

**Solution:** Free mobile app for mapping

# Project App SkyDrones

**Solution:** Free mobile app for mapping

- **Implementation:**
  - Using the Waypoints Missions Mobile SDK for mapping automated areas;
  - Telemetry;
  - Video Streaming;
  - Missions:
    - Simple Grid;
    - 3D Plane;
    - Circular;
    - Domain range.
- **Languages:**
  - Swift;
  - Java.
- **App Platforms:**
  - iOS;
  - Android.
- **Frameworks, SDKs:**
  - DJI SDK Mobile;
  - DJI SDK UX.

# Project Bayer - Strix-AG

2016/2

**Customer:** Bayer Crop Science

- **Customer Objective:**
  Identify and classify weeds automatically in soybean crops through the use of Drones.

- **Abstract:**
  Develop a solution for high resolution image acquisition with programmable height relative to the plant surface, through pre-programmed automatic flight and LIDAR sensor for active height control.

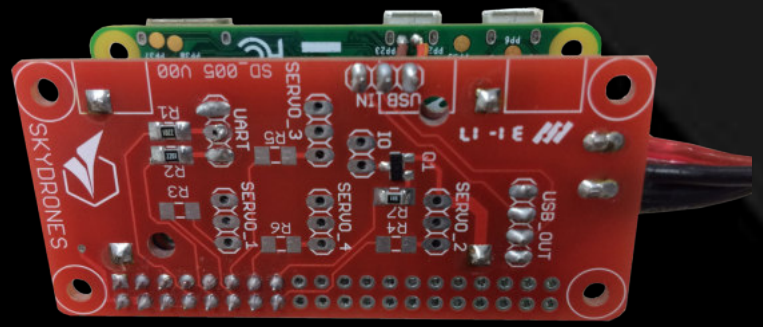
- **Status:**
  Active (more than 8000 flights by August 2018).

# Project Bayer - Strix-AG

**Solution:** Strix-AG

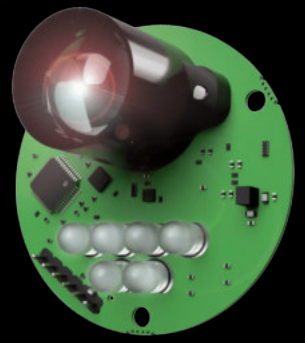
- Used platform: DJI Matrice 100 with SkyDrones developed *vacuum forming* fuselage protection.

- Onboard electronics with microcomputer and onboard SDK DJI.




- App WeedScout Air:

- LIDAR altimeter for height correction:



# Project Bayer - Strix-AG

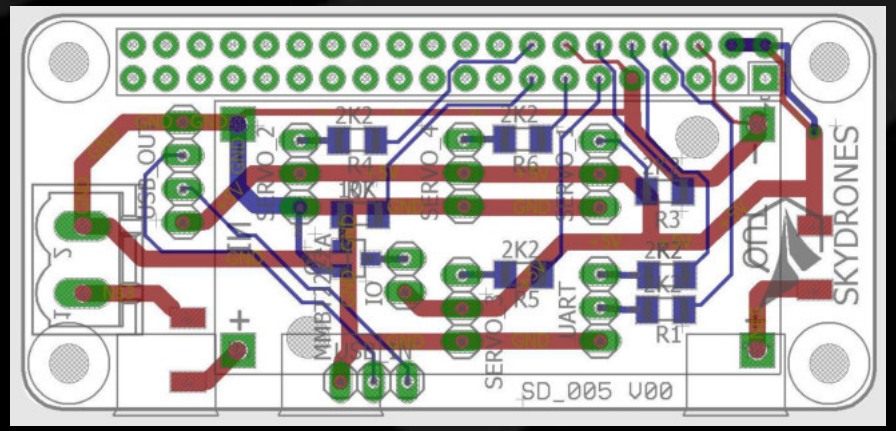
**Solution:** Strix-AG

- **Implementation:**
  - ROS and SDK Onboard for height control with LeddarOne sensor when taking automatic photos;
  - SDK Mobile for Waypoint missions imported via KML;
  - Video streaming;
  - Telemetry.

- **Languages:**
  - Python;
  - C++, C;
  - Swift;
  - SQL, PHP.

- **Frameworks, SDKs:**
  - DJI SDK Onboard;
  - DJI SDK Mobile;
  - ROS (Robotic Operating System).

- **App Platform:**
  - iOS.




Control Mother Board Interface - Strix-AG

# Project Strix-T1020

2017/1

**Customer:** Flir

- **Customer Objective:**
  Embark the Flir T1020 thermographic camera into a Drone and remotely control its functions through the Flight App.

- **Abstract:**
  Integrate the Flir T1020 camera to a drone and develop the hardware and software interface for its remote control.

- **Status:**
  Active.

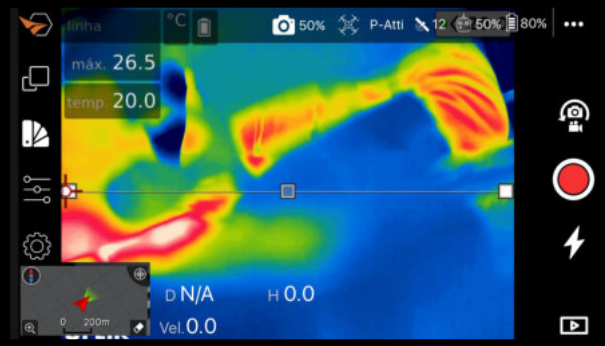
# Project Strix-T1020

**Solution:** Strix-T1020

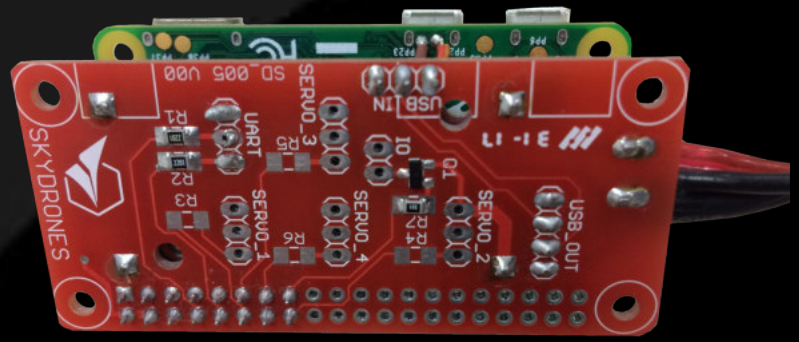
- Used platform: Matrice 600 and Ronin MX




- SkyDrones drone/camera integration App




- Onboard electronics with microcomputer and onboard SDK DJI.



# Project Strix-T1020

**Solution:** Strix-T1020

- **Implementation:**
  - ROS and Onboard SDK for camera control via sockets like Color palette, take radiometric pictures, video settings;
  - SDK Mobile to send App data to Onboard;
  - Video streaming;
  - Telemetry.
- **Languages:**
  - Python;
  - Swift.
- **App Platform:**
  - iOS.
- **Frameworks, SDKs:**
  - DJI SDK Onboard;
  - DJI SDK Mobile;
  - ROS (Robotic Operating System);
  - A2.

# Project SARtube

2017/2

**Client:** First Responders

- **Customer Objective:**
  Conduct remote searches and rescue using inflatable buoys attached to a Drone.

- **Abstract:**
  Develop a low-cost solution with hardware and software to launch self-inflating buoys to help search and rescue operation for people at risk of drowning.

- **Status:**
  Active.

# Project SARtube

**Solution:** SARtube

- Used platform: DJI Phantom 4 and Inspire 1/2

- Float device dropping system (hardware and software)

- App SARtube


- RESTUBE automatic inflation buoy

# Project SARtube

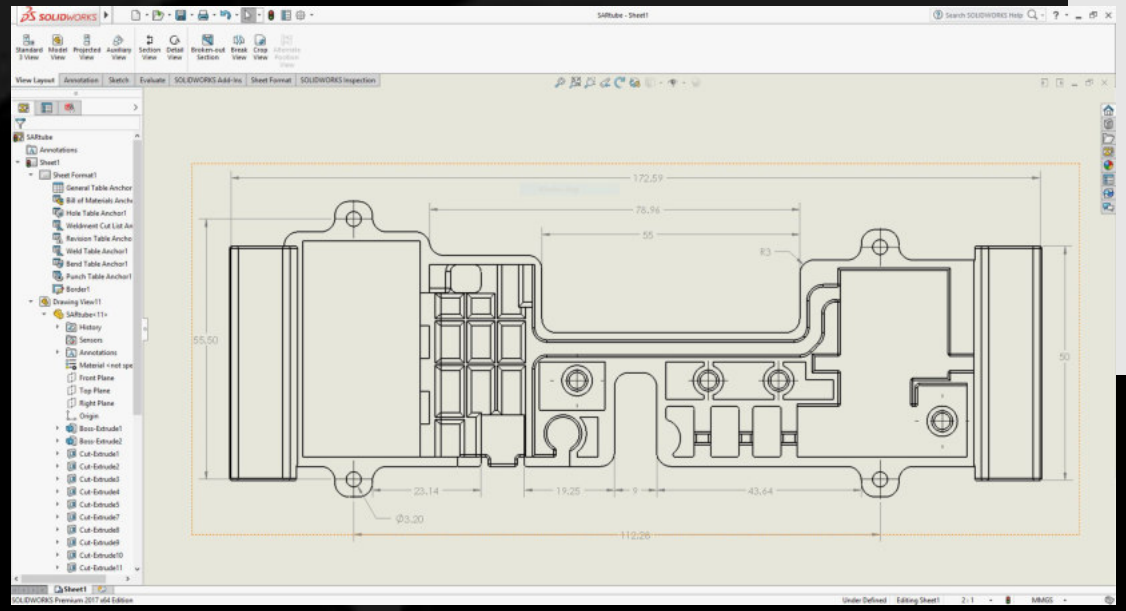
**Solution:** SARtube

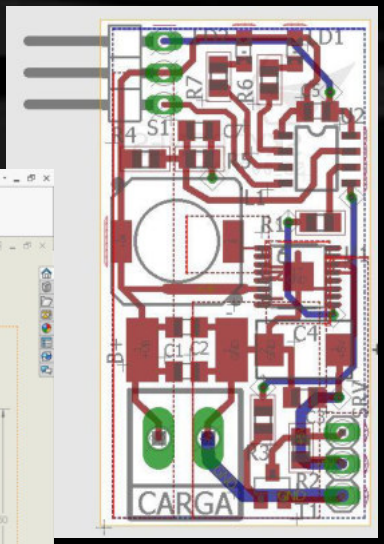
- **Implementation:**
  - Using the SDK Mobile to control servos to release the buoy;
  - Telemetry;
  - Video Streaming.

- **Languages:**
  - Swift;
  - Kotlin;
  - C.

- **Frameworks, SDKs:**
  - DJI SDK Mobile;
  - DJI SDK UX;
  - Firebase.

- **App Platforms:**
  - iOS;
  - Android.





# Project SkyPatrol

2018/1

**Customer:** Security Companies

- **Customer Objective:**
  Perform pre programmed perimeter rounds using Drones.

- **Abstract:**
  Develop a solution for the planning of rounds and automatic actions in establishments and properties.

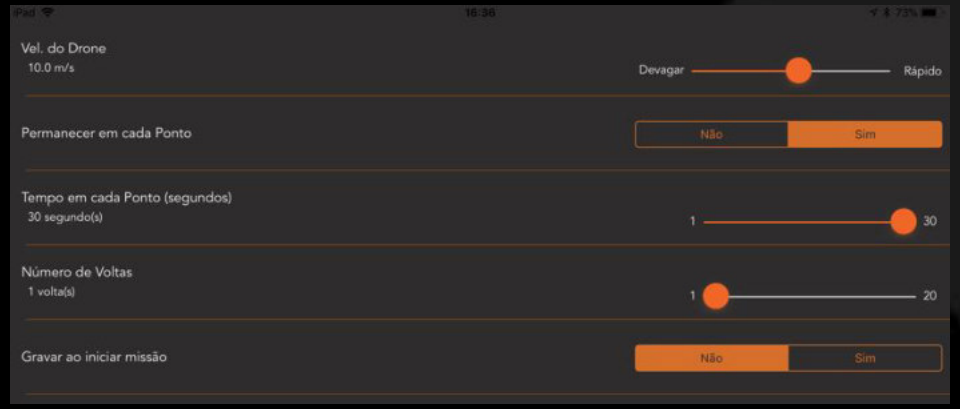
- **Status:**
  Under development.

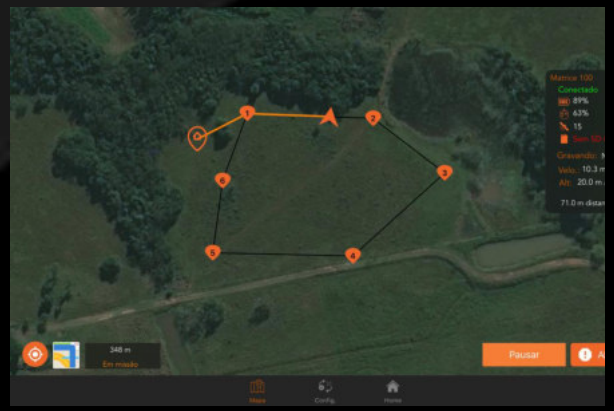
# Project SkyPatrol

**Solution:** SkyPatrol

- Used Platform: All DJI product line

- APP SkyPatrol



# Project SkyPatrol

**Solution:** SkyPatrol

- **Implementation:**
  - Mobile SDK for perimeter flight and action programming (Waypoint Missions);
  - Telemetry;
  - Video Streaming.
- **Languages:**
  - Swift;
- **Frameworks, SDKs:**
  - DJI SDK Mobile;
  - DJI SDK UX;
  - Firebase.
- **App Plataform:**
  - iOS.

# Project SmartUAV

2018/2

**Customer:** SmartX Technology

- **Customer Objective:**
  Automatically collect data from Beacons and RFID Tags.

- **Abstract:**
  Develop a system that automatically captures and processes information from Beacons and RFID tags following outdoor and indoor flight plans (indoor under development).

- **Status:**
  Active / under Development.

# Project SmartUAV

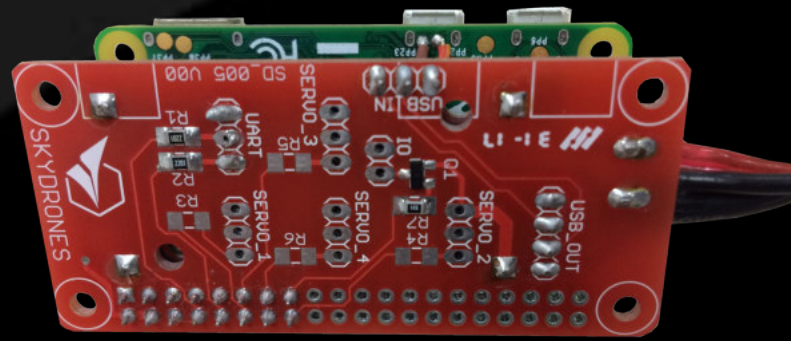
**Solution:** Integration between DJI drones, tags and beacons

- **Implementation:**
  - SDK Mobile for flight planning (Waypoints Missions) to detect RFID Tags and Beacons in real-time;
  - Receiving data from beacons via Bluetooth on Nodejs by Raspberry PI and sending to the App via the Onboard SDK with ROS;
  - A triangulation is performed to find the shortest detected distance.

- **Languages:**
  - Swift;
  - Nodejs;
  - Python.

- **App Platform:**
  - iOS.

- **Frameworks, SDKs:**
  - DJI SDK Mobile;
  - DJI SDK UX;
  - DJI SDK Onboard;
  - ROS;
  - Bluetooth Connector.



# Project AI Assisted Navigation

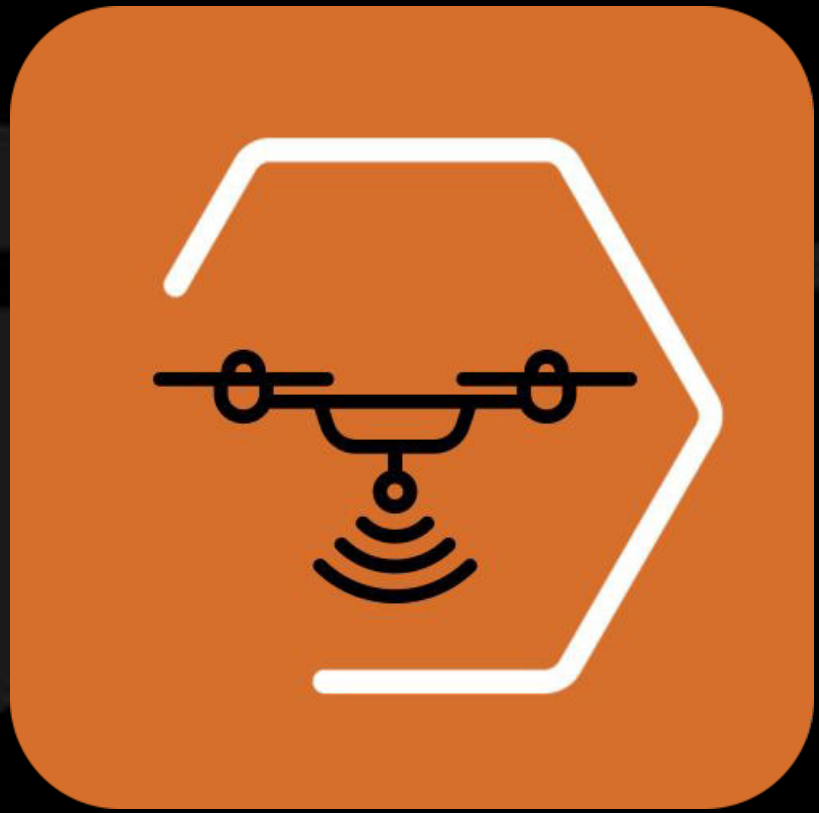
2016/1

**Customer:** Inspection Companies

- **Customer Objective:**
  Perform automatic inspection of transmission lines using drones with Artificial Intelligence.

- **Abstract:**
  Develop a solution for the inspection of transmission lines, using artificial intelligence and computer vision algorithms to automatically follow and inspect power transmission lines.

- **Status:**
  Under development.



# Project AI Assisted Navigation

**Solution:** Image assisted navigation using Artificial Intelligence

- Used platform: DJI Matrice 100 + Manifold
- **Implementation:**
  - Filtering images captured by the camera in real time: OpenCV.
  - Controlling Drone's attitude: DJI Onboard SDK.
- **Languages:**
  - Python;
  - C++.
- **App Platform:**
  - iOS.


- Artificial intelligence in action (automatically detecting transmission lines):

# Project Pest Control

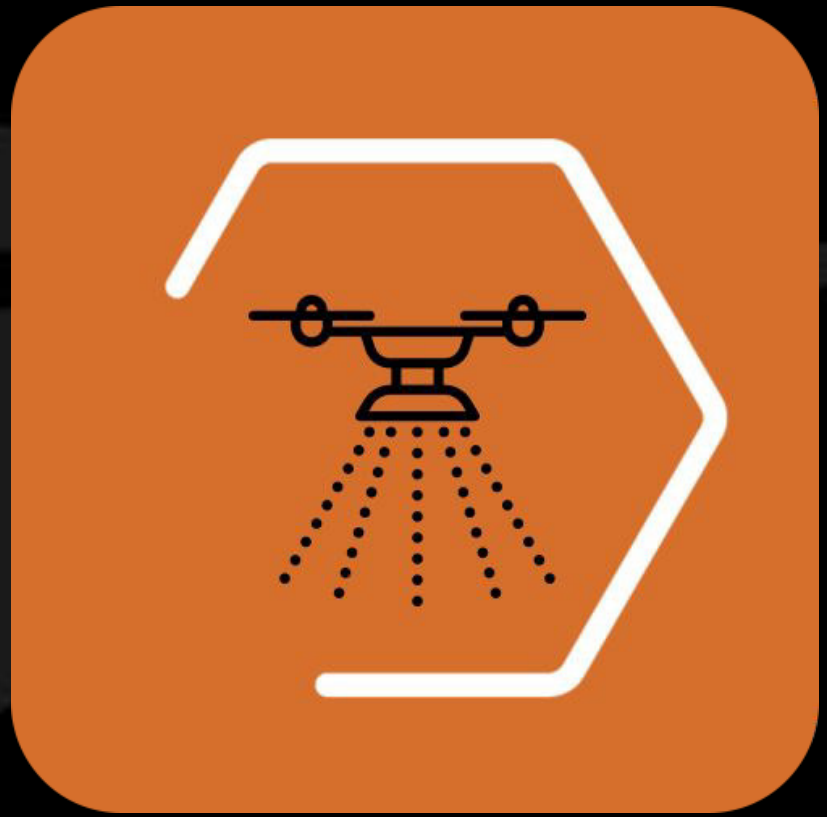
2017/1

**Customer:** Family Agriculture

- **Customer Objective:**
  Perform dispersal of chemical compounds for control of pests and weeds with small Drones.

- **Abstract:**
  Develop a docking and dispensing device in a drone for the remote dispersion of chemical compounds.
  Development of hardware, software and mission app.

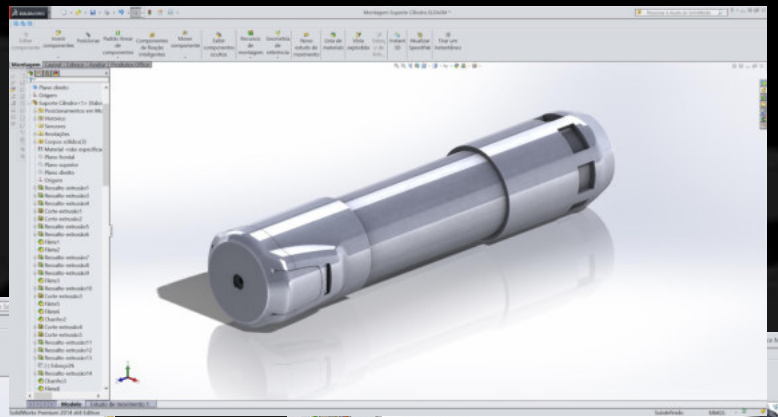
- **Status:**
  Under development.

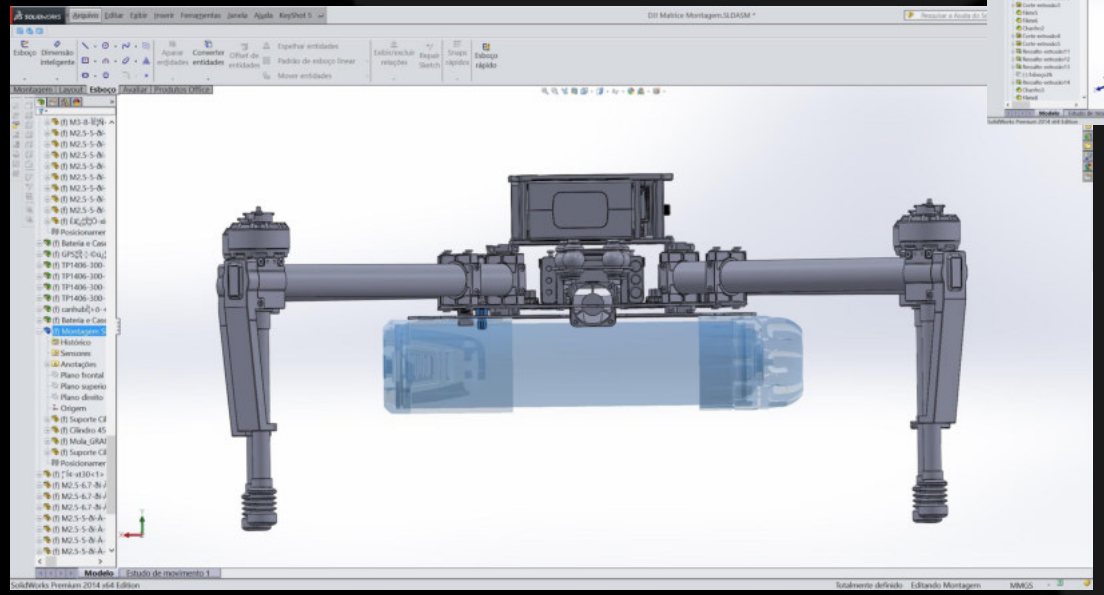


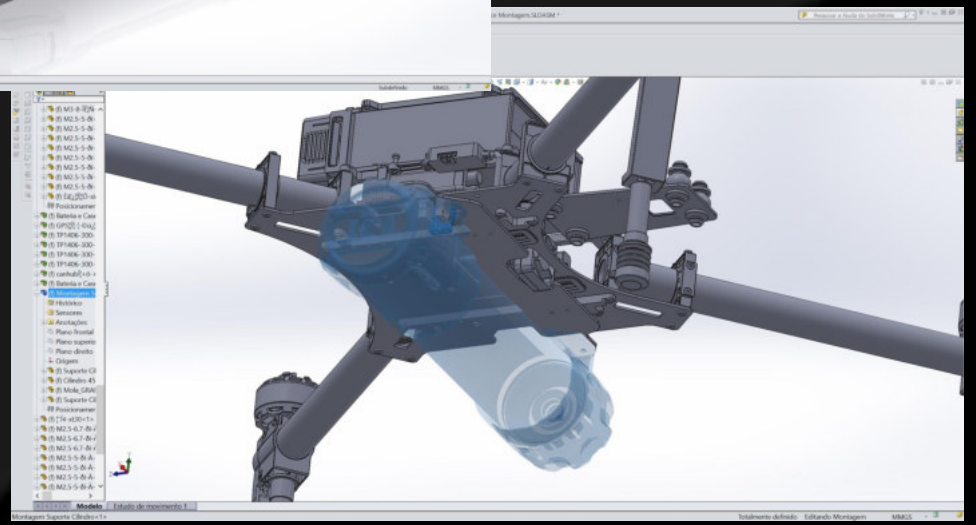
# Project Pest Control

**Solution:** Remote spraying device

- Used platform: DJI Matrice 100.
- Spray container docking and drive device.







# Project - Strix-BIO

2018/2

**Customer:** SkyAgri

- **Customer Objective:**
  Disperse solid Biological defensives automatically through the use of Drones.

- **Abstract:**
  Develop a solution for high precision controlled dispersion of Biological agro defensives with programmable height relative to the plant surface, through pre-programmed automatic flight and LIDAR sensor for active height control.

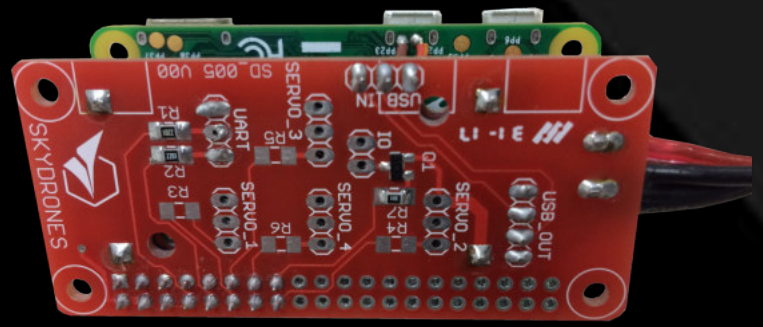
- **Status:**
  Active.

# Project - Strix-BIO

**Solution:** Strix-BIO

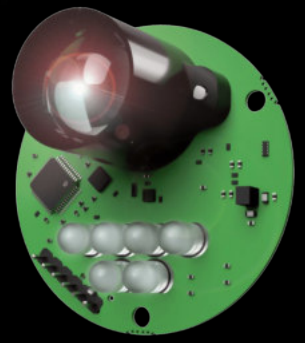
- Used platform: DJI Matrice 100 with SkyDrones developed *vacuum forming* fuselage protection.

- Onboard electronics with microcomputer and onboard SDK DJI to interface Bio dispenser.




- App SDBio Air:

- LIDAR altimeter for height correction:



# Project - Strix-BIO

**Solution:** Strix-BIO

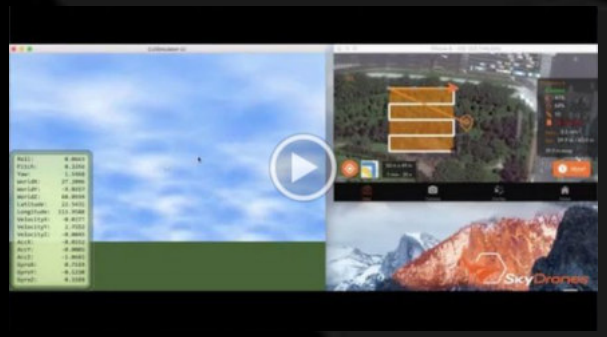
- **Implementation:**
  - ROS and SDK Onboard for height control with LeddarOne sensor when taking automatic photos;
  - SDK Mobile for Waypoint missions imported via KML;
  - Video streaming;
  - Telemetry.
- **Languages:**
  - Python;
  - C++, C;
  - Swift;
  - SQL, PHP.

Biological dispenser - Strix-BIO

- **Frameworks, SDKs:**
  - DJI SDK Onboard;
  - DJI SDK Mobile;
  - ROS (Robotic Operating System).
- **App Platform:**
  - iOS.

# External Attachments:

Click on the images to see the videos



Presentation SDK DJI (portuguese)


SkyDrones App

Weedscout - Strix-AG


Strix-T1020


SARtube


Power lines - A.I. Assisted Navigation

# SkyDrones

The sky is not our limit.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