

# Aerial Robotics in ROS

First exploratory meeting!

Kimberly McGuire



Ramon Roche



# Agenda for today

- Introduction: Our motivation to outreach the ROS 2 community.
  - **Goal:** Potential Aerial Robotics Workgroup
- Discussion:
  - Motivation to use ROS for aerial robotics?
  - Let's hear your use cases
  - Current solution for ROS 2 integration? What is missing?
- Next Steps: Would you like to participate in recurring meetings?



# Some stats!

- **Name and affiliation?**
  - 60 % Industry, 30 % Academia, 10% Hobbyists
- **Which aerial platform do you use, autopilot and which ROS package?**
  - All kinds of aerial platforms!
  - PX4 biggest, but some use Ardupilot, DJI SDK and the Crazyflie
  - MAVros for ROS 1, Nav 1 and 2, own navigation stacks
- **What are you still missing in ROS framework for your platform and project**
  - Better integration with autopilot and ROS2
  - Less 'bridges'
  - An autonomy stack for Aerial robotics
  - Standardization

\* [Data Source](#)

# Our motivation to outreach the ROS 2 community.

## *Notes*

Kim: Gave a ROScon presentation last year, loved the community and got to meet Ramon. Felt that many aerial roboticst are active in ROS but there is no workgroup or guidance yet and seems that many agreed.

Ramon: The future of PX4 is ROS2 and we are planning to go all in for better integration. Also very interested in hearing all of your usecases and concerns of PX4 and ROS2

# Discussion time! Intros from the users and concerns

## *Notes*

**Ayham**, Researcher from Netherlands, getting started with ROS 2, a messy time, they are using PX4, the project was migrating from FastRTPS to microDDS, lack of docs was a main problem. One thing that can be improved, Matching releases ROS and PX4 (or other flight stack) release

**Fred**: finding small compute platforms that can run ROS 2, NAV 2

**Adam**: it's confusing what is happening with PX4 and ROS, should we stick with a version? Is there a timeline? We need certainty things will work

**Pierre**: There are a lot of ways to simulate a drone, there's no guides on how to achieve this, each project defines their own way, maybe we should have a wiki page dedicated to simulation

# Motivation to use ROS for aerial robotics?

## *Notes*

**Ayham**, Some users are not developers by training, and they need a platform they can wrap their head around with a smooth learning curve, when you are trying to integrate a robotics project its the best tool with a large community.

**Pierre**, freelance job on the last two year, people are using ROS because it brings an interesting set of APIs

**Benjamin**, Clean separation you can get, a distributed layout, embedded system is the real time system handling the safety and operation, and ROS can run higher level computing

**Fred**: it comes down to keeping flight dynamics down to the flight controller as much as possible, leaving the rest to a higher compute processing unit

**Aarsh**: connecting multiple robots, its easier to port between platforms (DJI, Parrot, Crazyflie), modularity.

# Let's hear your use cases?

## *Notes*

**Ryan:** AeroVironment, it's on their autonomy stack, they have another compute box for mapping missions, survey and swarming, on a fixed wing platform for ROS 1, currently evaluating ROS 2

**Jorge:** The networking requirements is one of the reasons they are not using ROS 2 right now

**Ayham:** Aerial physical interaction, they are developing aerial manipulators, fast interaction tasks, it requires you to develop your own low level controllers that can handle interaction. They need to build their own controllers.

# Should we start a workgroup?

YES (almost everybody raised their hands)