ARDUPILOT
Versatile, Trusted, Open

ArduPilot : ArduPilot Advanced Integration

Pierre Kancir - FOSDEM 2026

About Me

- Robotics engineer since 2013
- Work with SME on mobile robots : Drone-in-box, Food delivery, inflatable robot arm, patrol rovers, etc.
- Contributor in FOSS robotics since 2014 : ArduPilot, ROS1, etc.

Sponsored By AISPRID (https://aisprid.com/en/):

AI-driven autonomous robot for tomato plants deleafing

ArduPilot

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Autopilot ? System that allows autonomously without constant manual control. It consists of hardware (flight controllers, sensors, and actuators) and software (algorithms for navigation, stability, and mission execution).

- **Versatile** - rich in features with support for a large number of flight controllers, sensors and frame types
- **Trusted** - reliable and predictable
- **Open** - both in terms of software and in our team's organisation and governance

Full presentation last year : ArduPilot FOSDEM25

ArduPilot for who ?

Online comments :

- “ArduPilot is for hobby and isn’t suited for commercial product”
- “ArduPilot is limited on capabilities without ROS support and Jetson”

For Shure

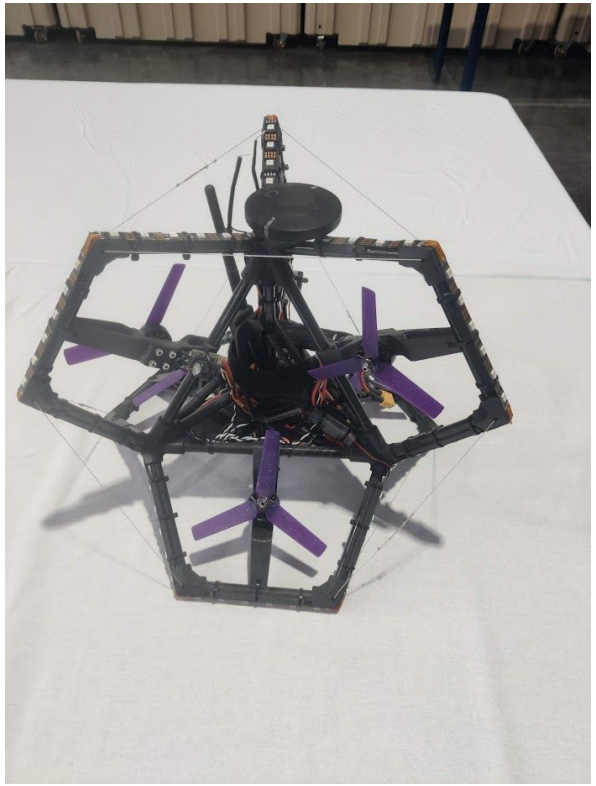
Here is a selection of possibilities !

ArduPilot Advanced Plateforms

True OmniCopter (6DoF) from Peter Hall from 2021

- Video and explaination at https://hackaday.com/2021/01/09/six-degrees-of-freedom-omnicopter-with-ardupilot/
- https://www.khunmanned.com/

KH Unmanned



ArduPilot Advanced Plateforms

Tri-Reductant Autonomous drone for delivery

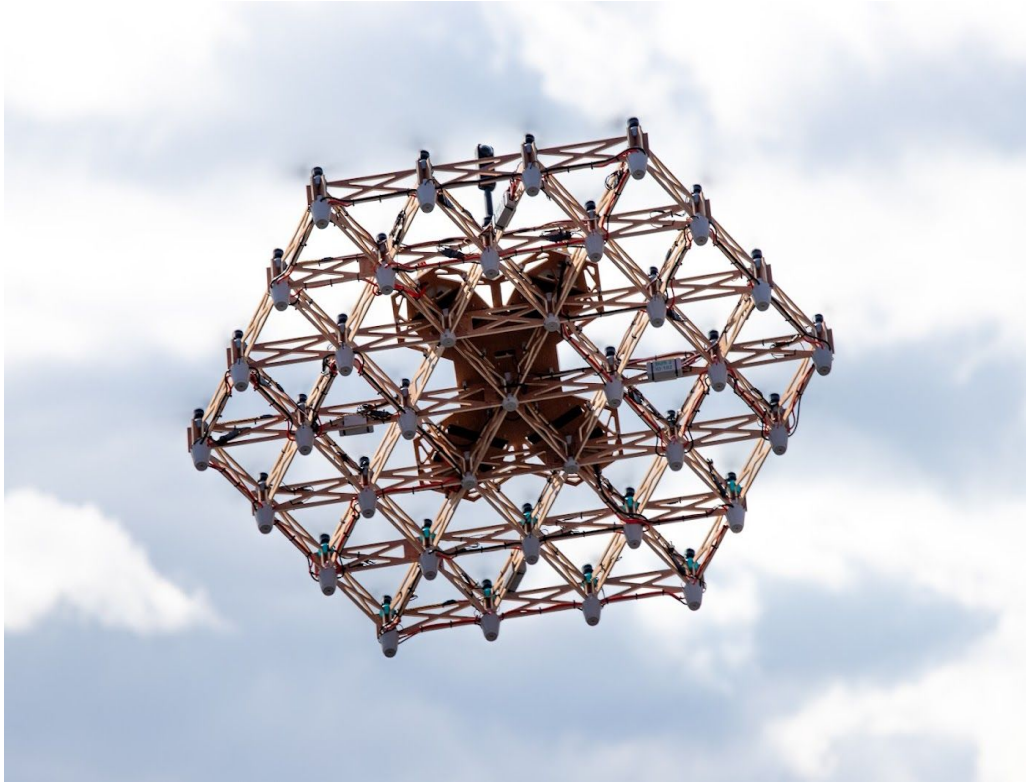
- https://www.manna.aero/ 🇮🇪

ArduPilot Advanced Plateforms

JustBecauseWeCANCopter

- 32 motors in sync with DroneCAN

KH Unmanned



ArduPilot Advanced Plateforms

SailingRover by

- Rhys Mainwaring 🇬🇧:
  - ArduPilot developer
  - Gazebo Wizard

- Gazebo sim available
- Build instructions will be release soon

ArduPilot Advanced Plateforms

3D-Printed F35 VTOL by

- Eric Maglio (ArduPilot Dev)

  https://www.ericmaglio.com/f-35b-vtol

- https://www.youtube.com/watch?v=VknG6mLFmdc

ArduPilot Advanced Plateforms

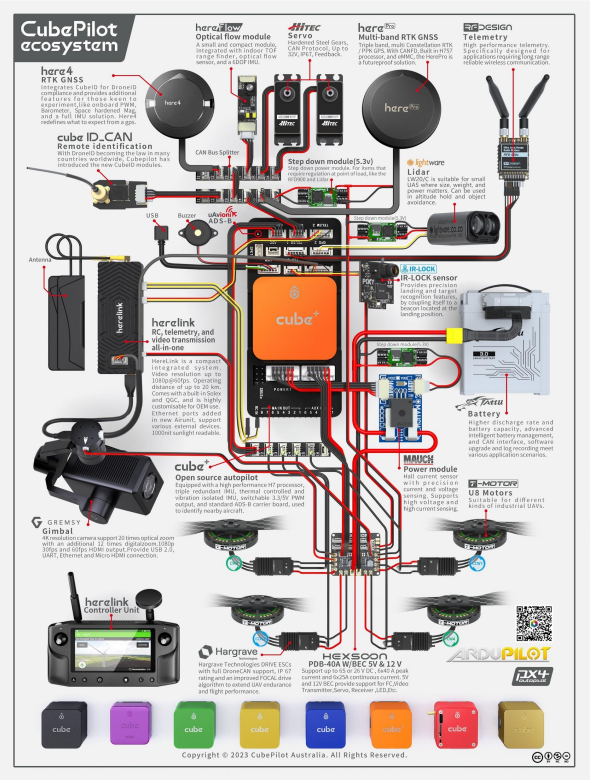
Common Points on all those ?

- No trendy software (ROS2, etc)
- No trendy Hardware (Jetson, etc)

But Excellent Integration both Software and Hardware !

How to do good integration ?

What people think we have ⟶



How to do good integration ?

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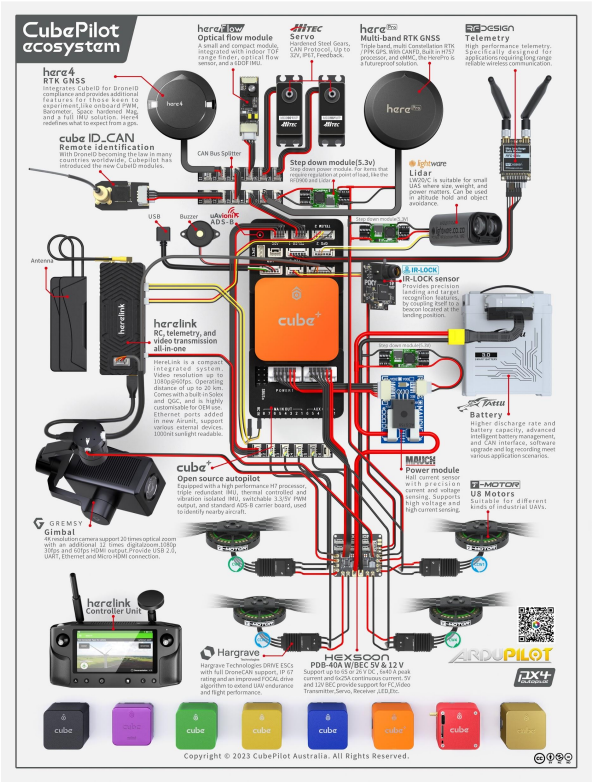

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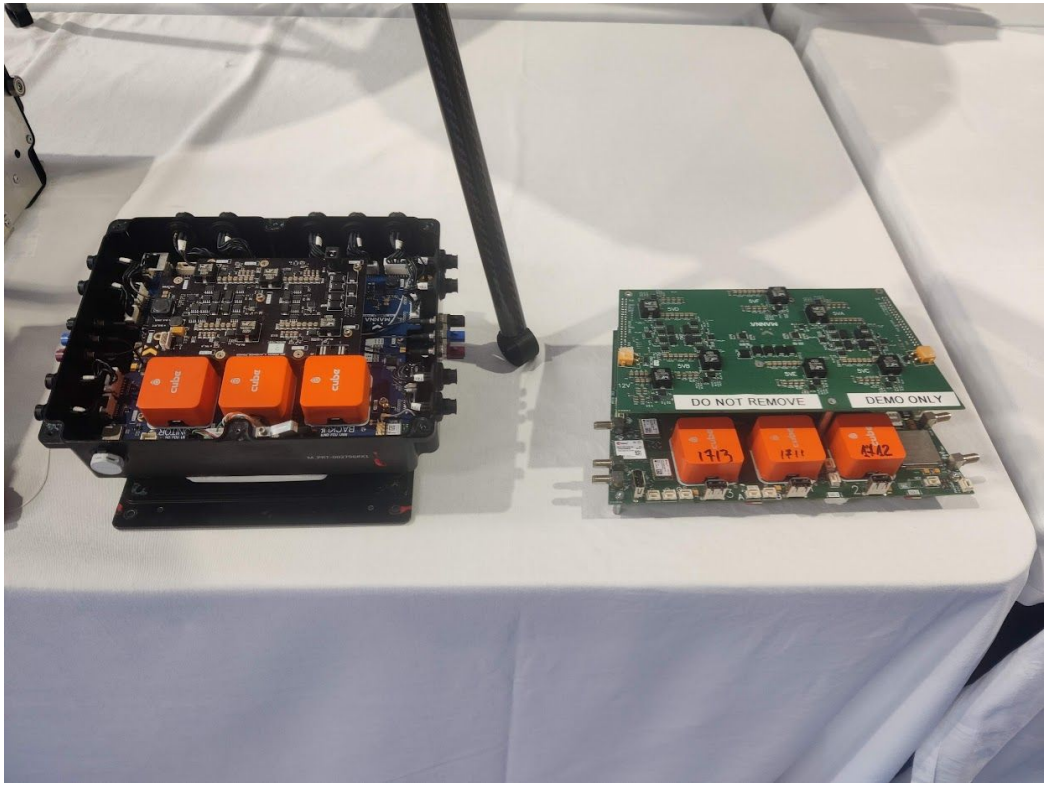

- Extrem integration (#€€€€€€€)

- Blog post about the ArduPilot part: https://discuss.ardupilot.org/t/boost-your-drone-s-iq-with-dual-autopilot-systems-using-ardupilot/121358

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What has ArduPilot done toward better integration?

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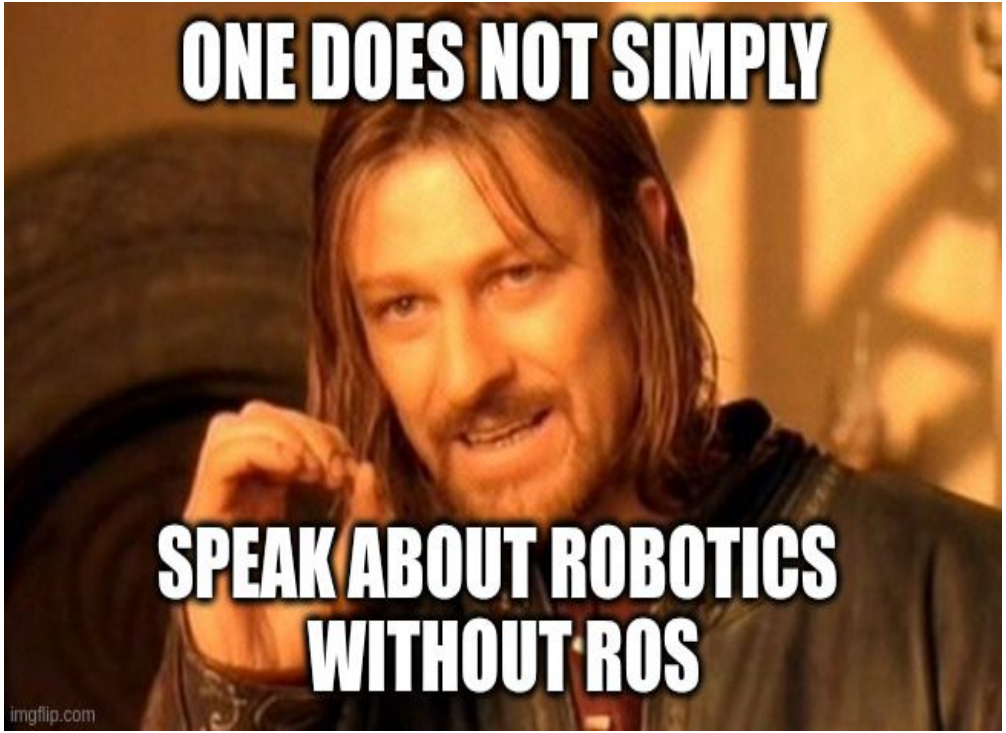

- ROS 2 support with/without MAVROS
- DDS support
- Zenoh planned
- PlotJuggler Support even on Windows !

What has ArduPilot done toward better integration?

- Cell Modem Support (on microcontroller) https://discuss.ardupilot.org/t/lte-modem-support/135518

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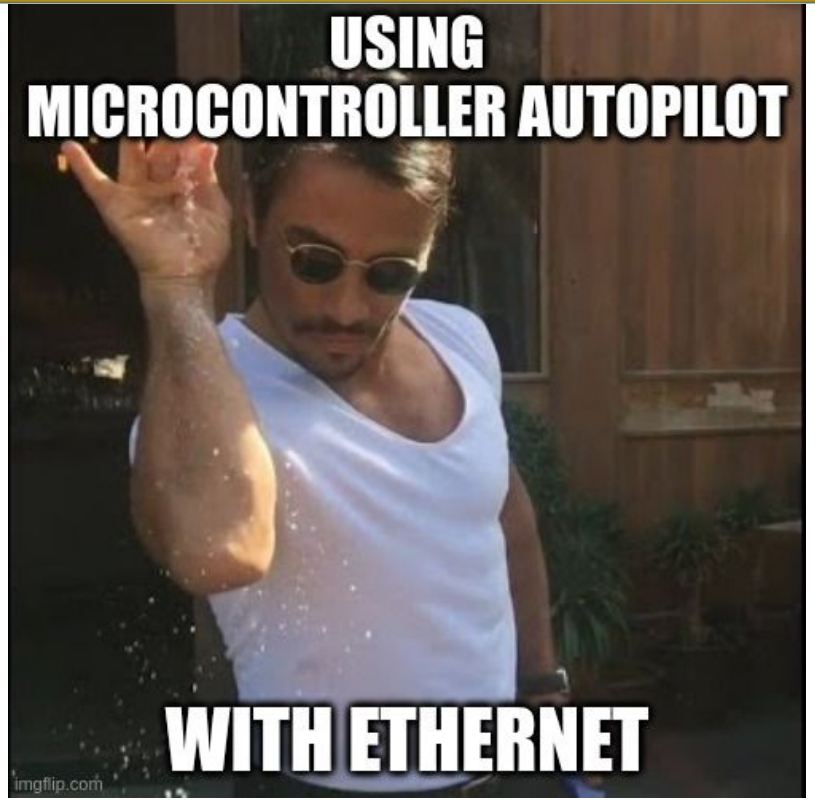
- Cell Modem Support (on microcontroller)
  https://discuss.ardupilot.org/t/lte-modem-support/135518

- TCP/IP support in MicroController
  https://ardupilot.org/plane/docs/common-network.html
  → Adapters to retrofit on old hardware possible !



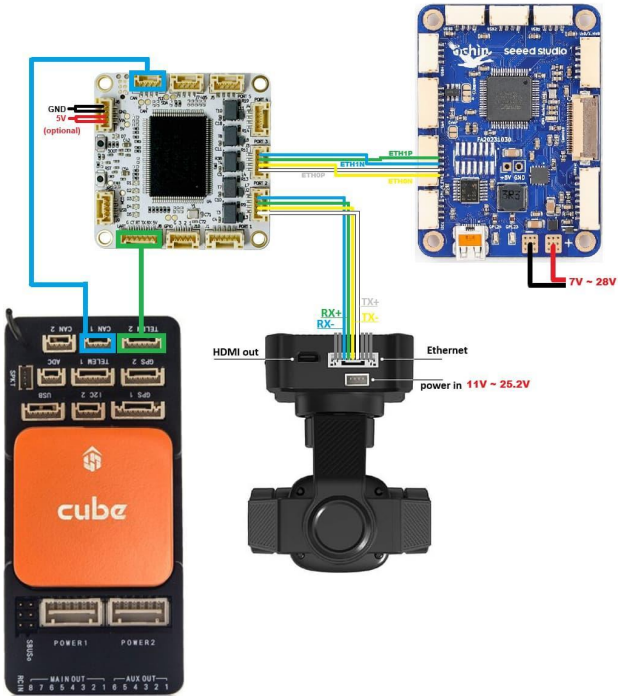
Example integration

Thanks to Randy Mackay
and Partners for the drone

JDrone example

- CubeOrange+, Here4 GPS
- CubeNode as serial<->ethernet adapter
- RPI CM4 or CM5 companion computer
- AM32 ESCs based on VimDrones design
- Quectel LTE modem or Herelink
- XF Robot Z-1 mini camera gimbal
- Hereflow optical flow
- Benewake TFS20-L (down), TF-Nova (forward)
- T-motors MN2806 400KV motors
- MAD 12" folding propellers
- Foxtech semi-solid state 6S battery 5500mAh
- VimDrones battery BMS
- **3D printed frame** (ASA-CF, PA12W (nylon))

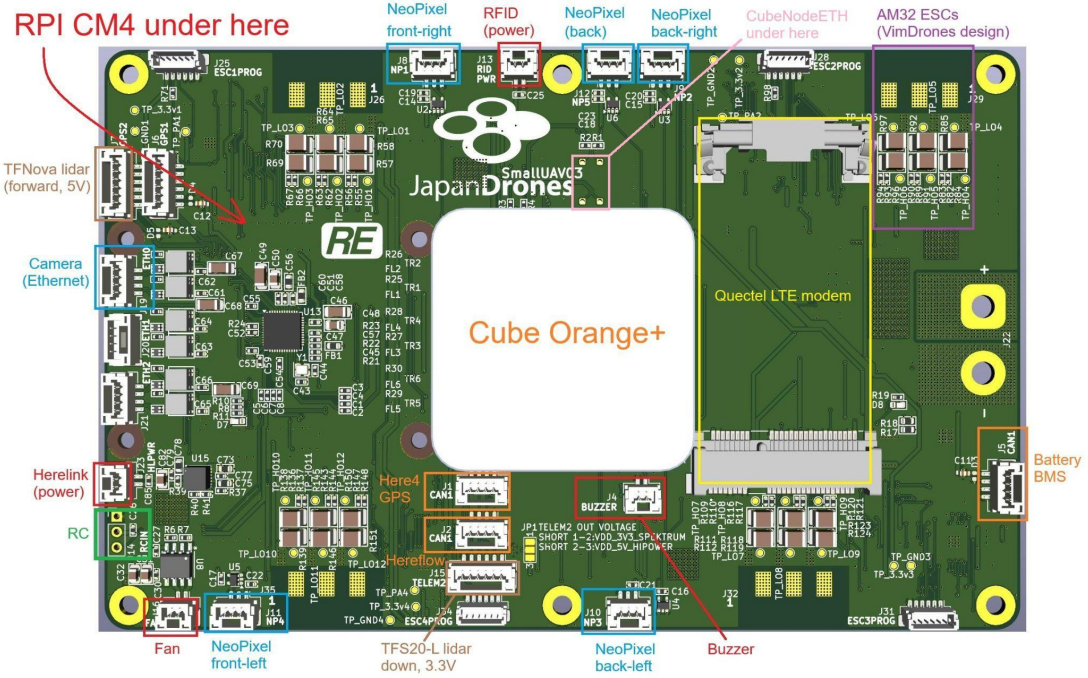
Weight: 1.5kg



JDrone example

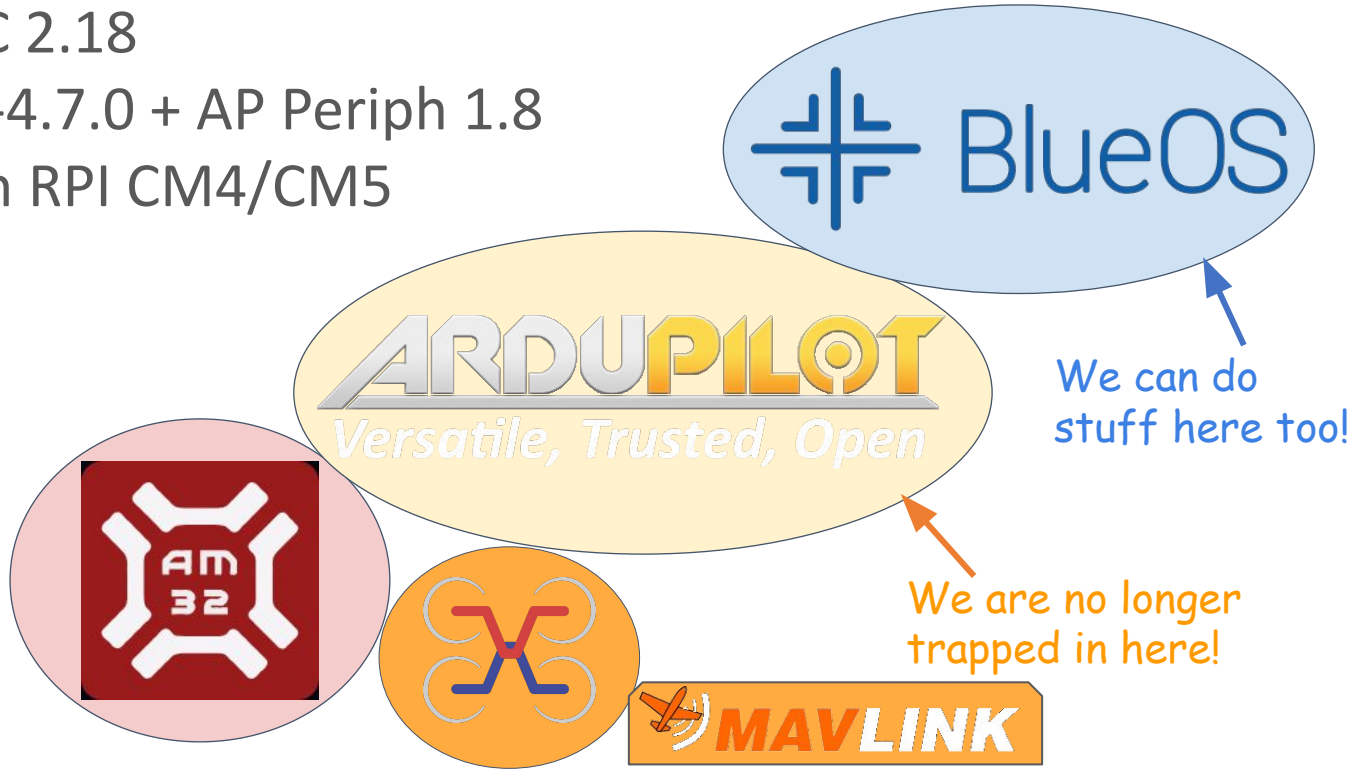
Custom Carrier Board

- Improves rigidity
- Fit the frame
- Less wires
- Eases assembly
- Saves weight & cost



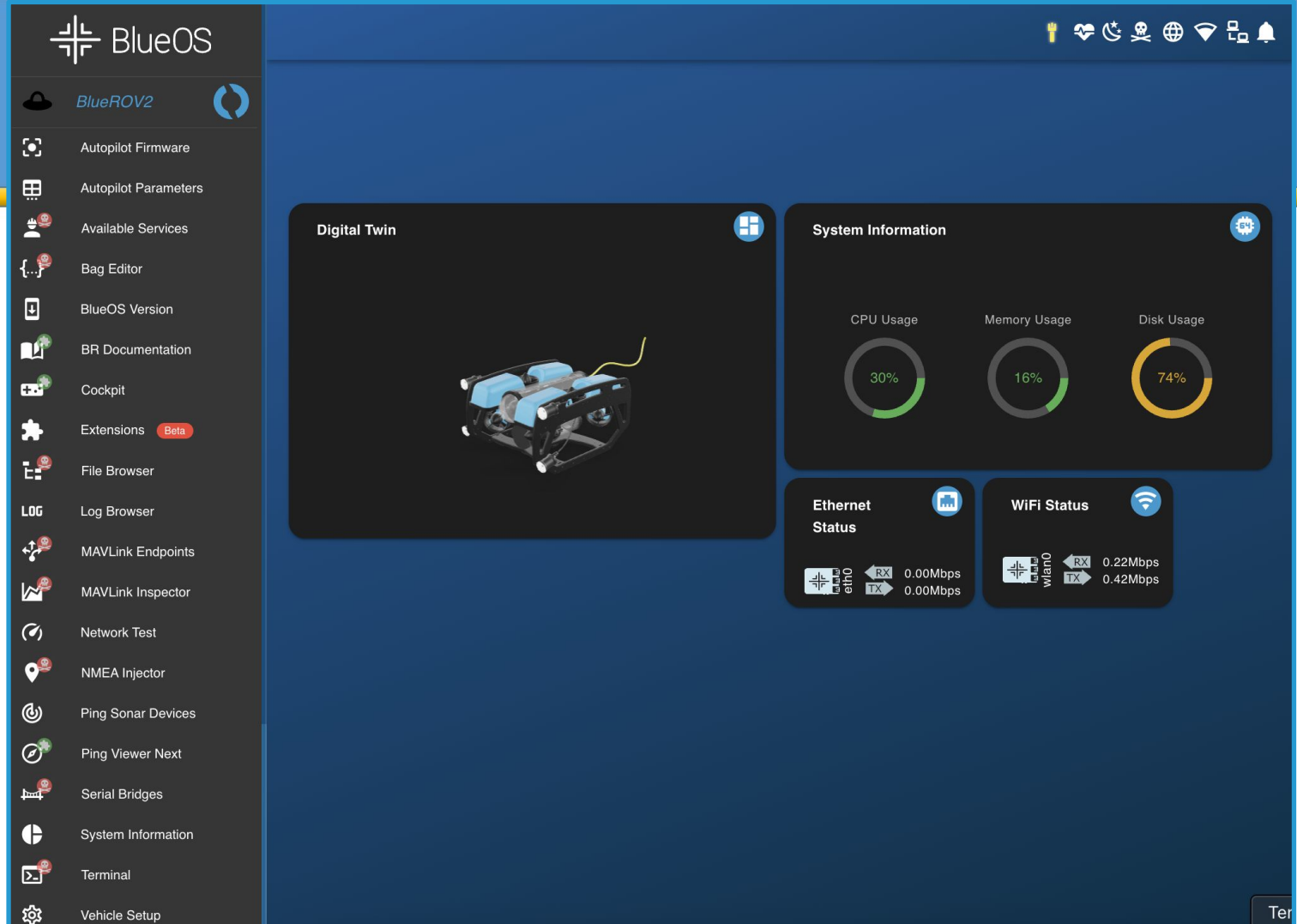
Software

- ★ AM32 ESC 2.18
- ★ ArduPilot-4.7.0 + AP Periph 1.8
- ★ BlueOS on RPI CM4/CM5
- ★ DroneCan
- ★ Mavlink



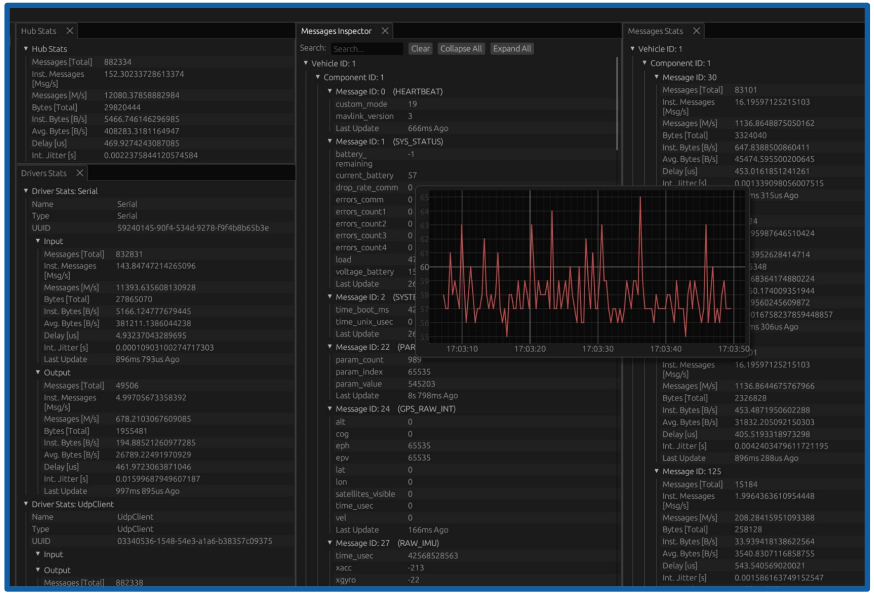
BlueOS

- Docker
- UI
- Extension



JDrone Integration

- ★ LTE telemetry (using ZeroTier extension)
- ★ High altitude optical flow (using camera gimbal)
- ★ Precision landing
  - on April tags
  - (using camera gimbal)
- ★ Automatic upload to the cloud:
  - image
  - video
- ★ Video and Telemetry Streaming
- ★ Ethernet Network
- ★ NTRIP



Demo

No time … And the drone got a broken arm !

- Ask me for Static Tour !

- Videos in flight for opflow and precland : https://discuss.ardupilot.org/t/blueos-extension-for-optical-flow-and-precision-landing/136798

- BlueOS docs : https://bluerobotics.com/what-is-blueos/

ArduPilot Community

Thriving, friendly community

- Main website and documentation ardupilot.org
- Discussion and support site discuss.ardupilot.org
- Developer chat on discord https://ardupilot.org/discord
- Active commercial partner program https://ardupilot.org/about/partners
- Source code https://github.com/ArduPilot/
- Two dev calls a week
  - Tuesday morning AU time (US friendly time)
  - Wednesday evening AU time (EU friendly time)
  - join on discord, new devs welcome

Contact :
pierre.kancir.emn@gmail.com