Avular

nlr

Paul Janssen
Avular

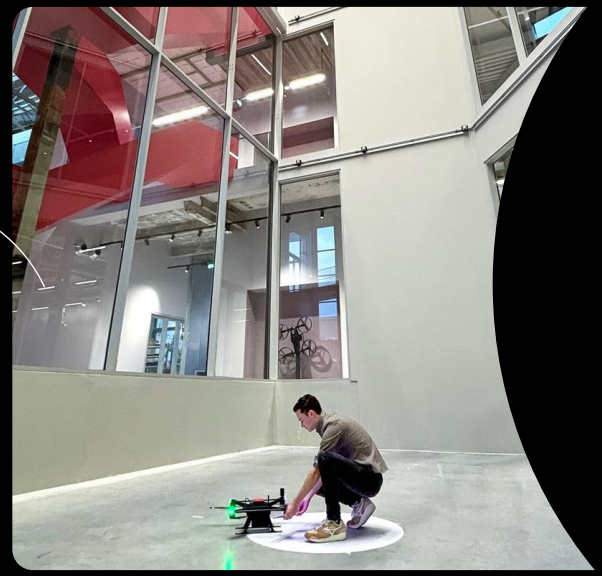
Our world-class team

Our A-class office

Our robotics testing lab

A-location in the smartest region of the world

The birth ground of Philips & ASML and up until now already **9** - time robotic world champion!



TU/e

D A E
Design Academy Eindhoven

ASML

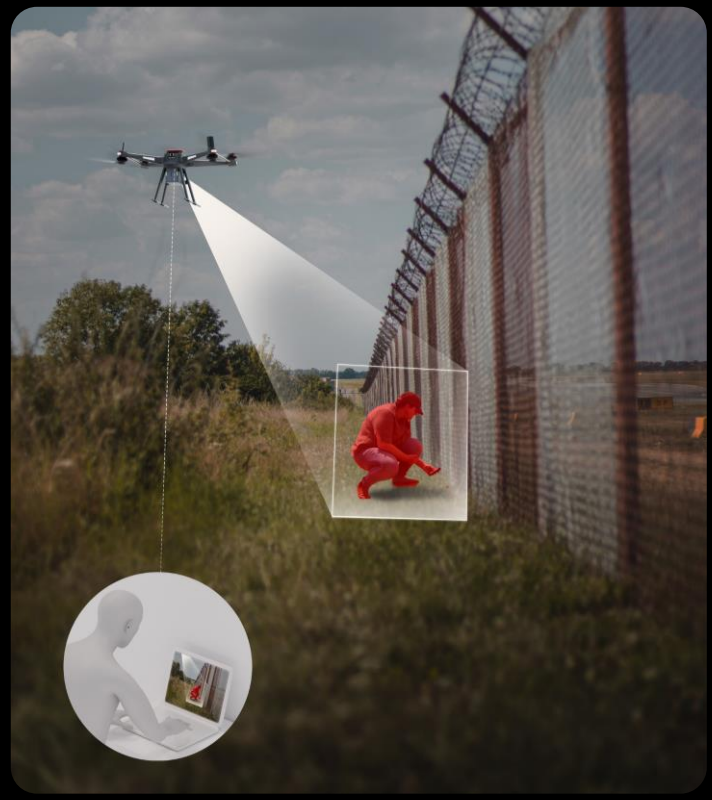
BRAINPORT EINDHOVEN

Tailored Robots

Taylor-made mobile robotic solutions

Robots for Research

Off-the-shelve modular robotic platforms



Drones for Our Security

Off-the-shelve family of drones

A family of mobile robotic systems

Our autonomy hard- & (AI) software blocks at the core

Integration of our autonomy core (hard & software) in other machines

Our Origin, the foundation for new driving applications

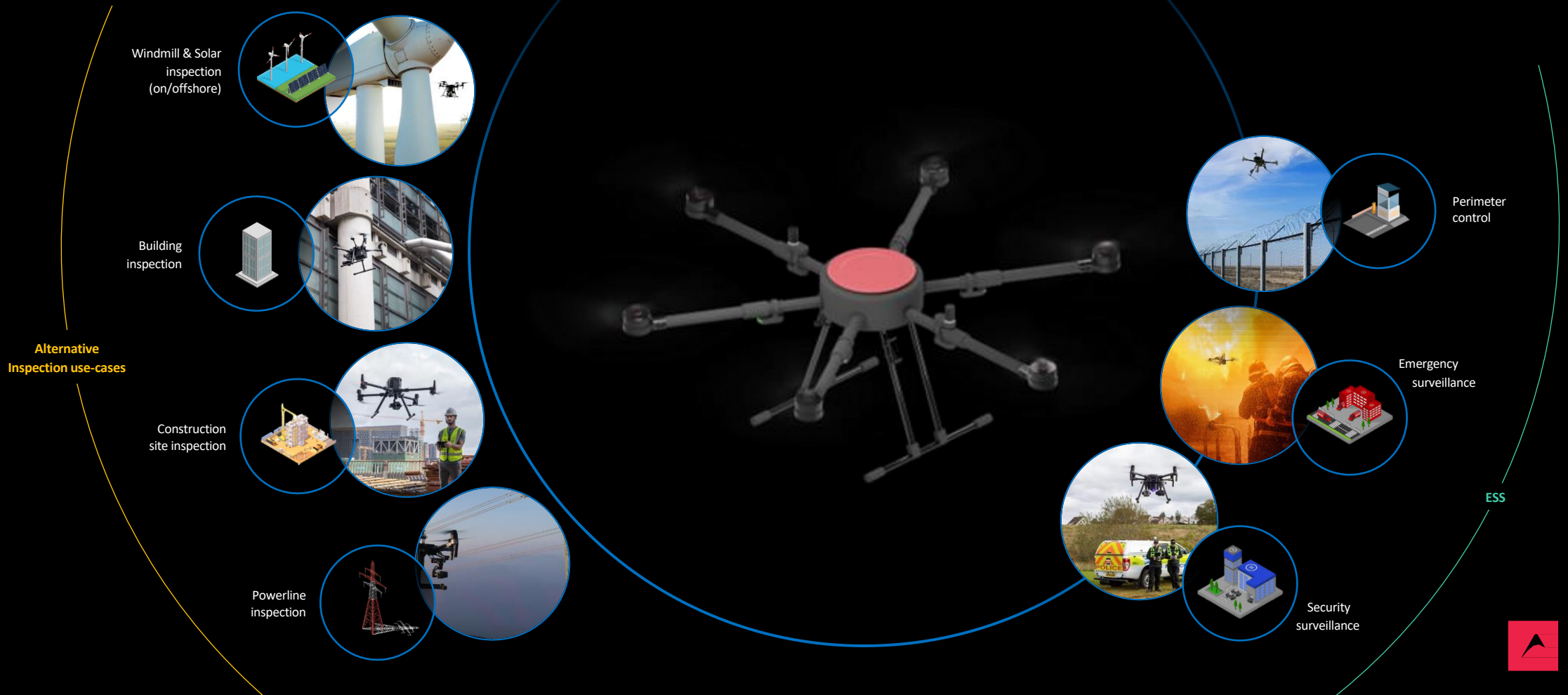
Our Vertex, a fully EU-owned autonomous drone platform

Our Apex, the first step towards our flying family-of-systems

Avular Flying

Unlimited possibilities

One Platform
Endless Applications

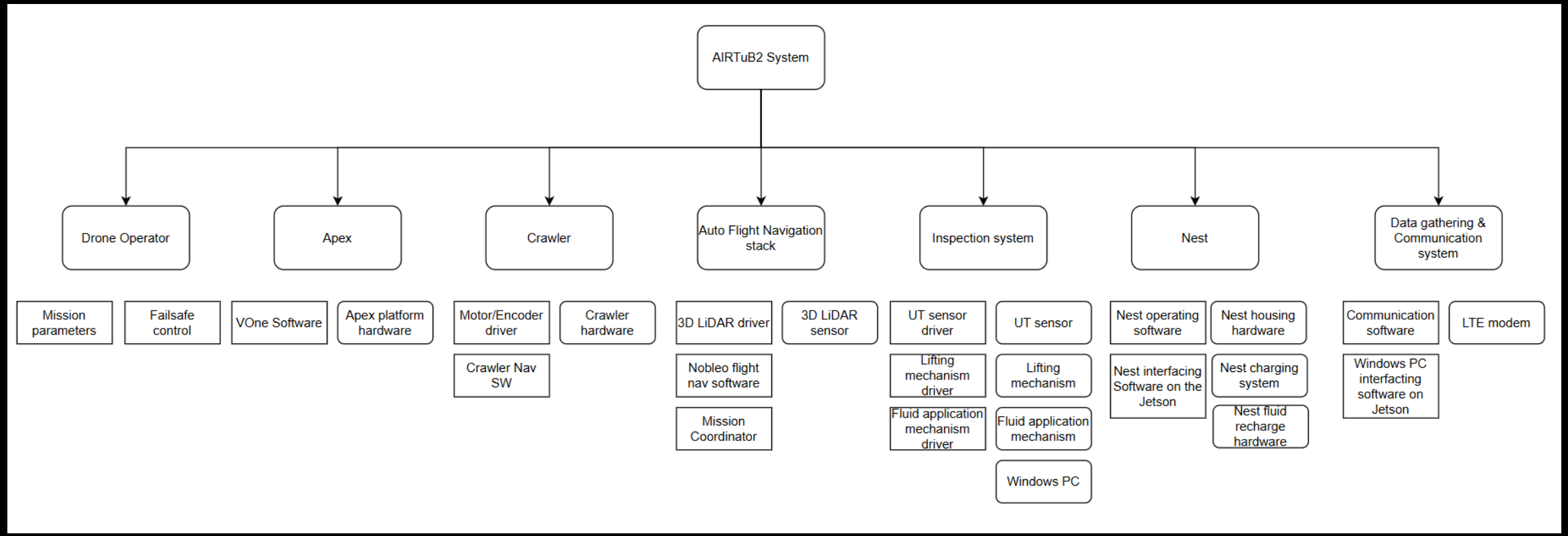


Avular's role in AIRTuB2

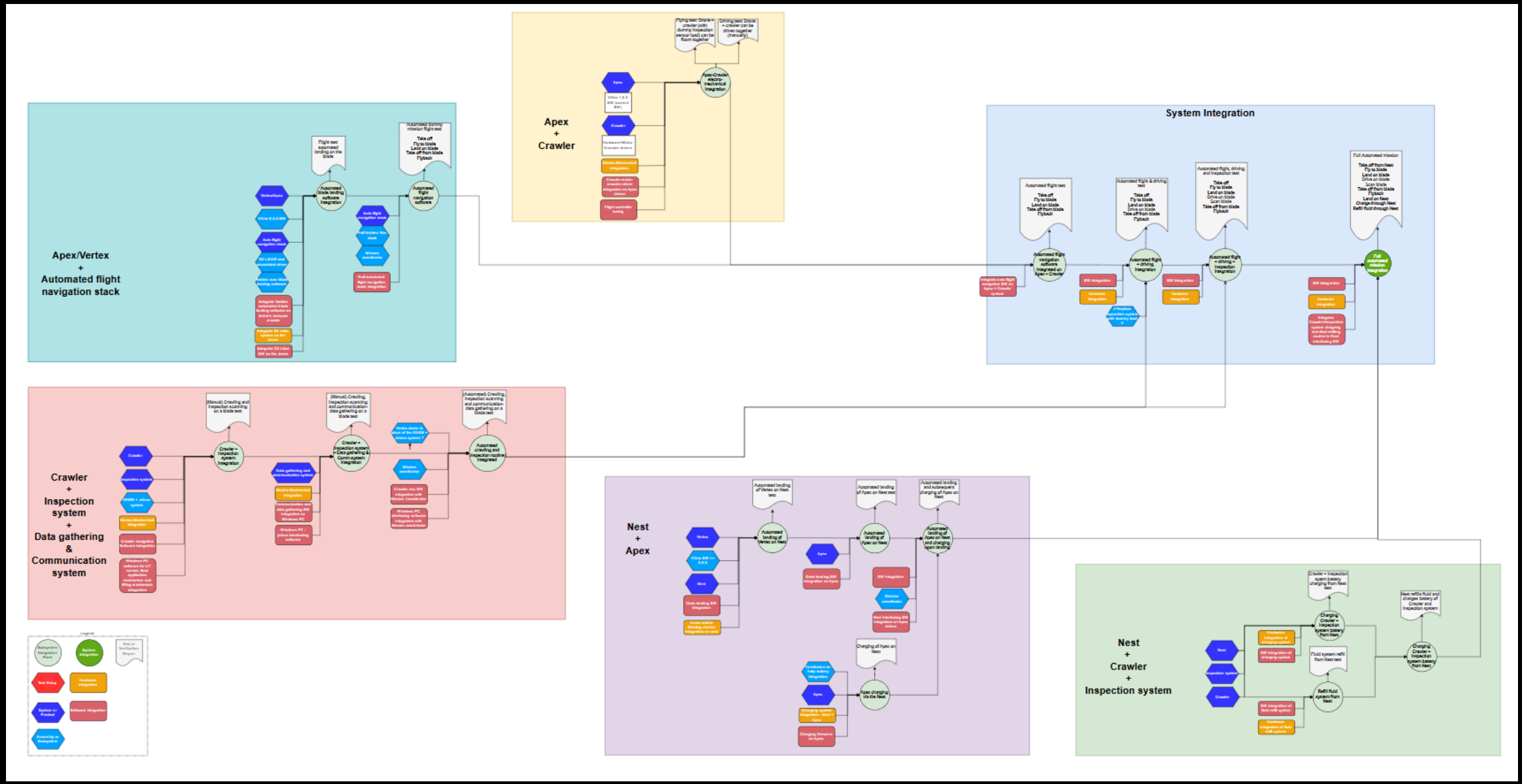
- Provide drone platform → Apex, hexacopter
- Automate & orchestrate complete mission workflow
- Automated failsafe behaviors
- Automated flight navigation
- Vision-based landing on dock

- Together with NLR oversee all flying related integration & testing
  - Certified facilities → experimental airborne systems
  - Terra Inspectioneering to operate the AIRTuB2 airborne system

AIRTuB2 – System of Systems



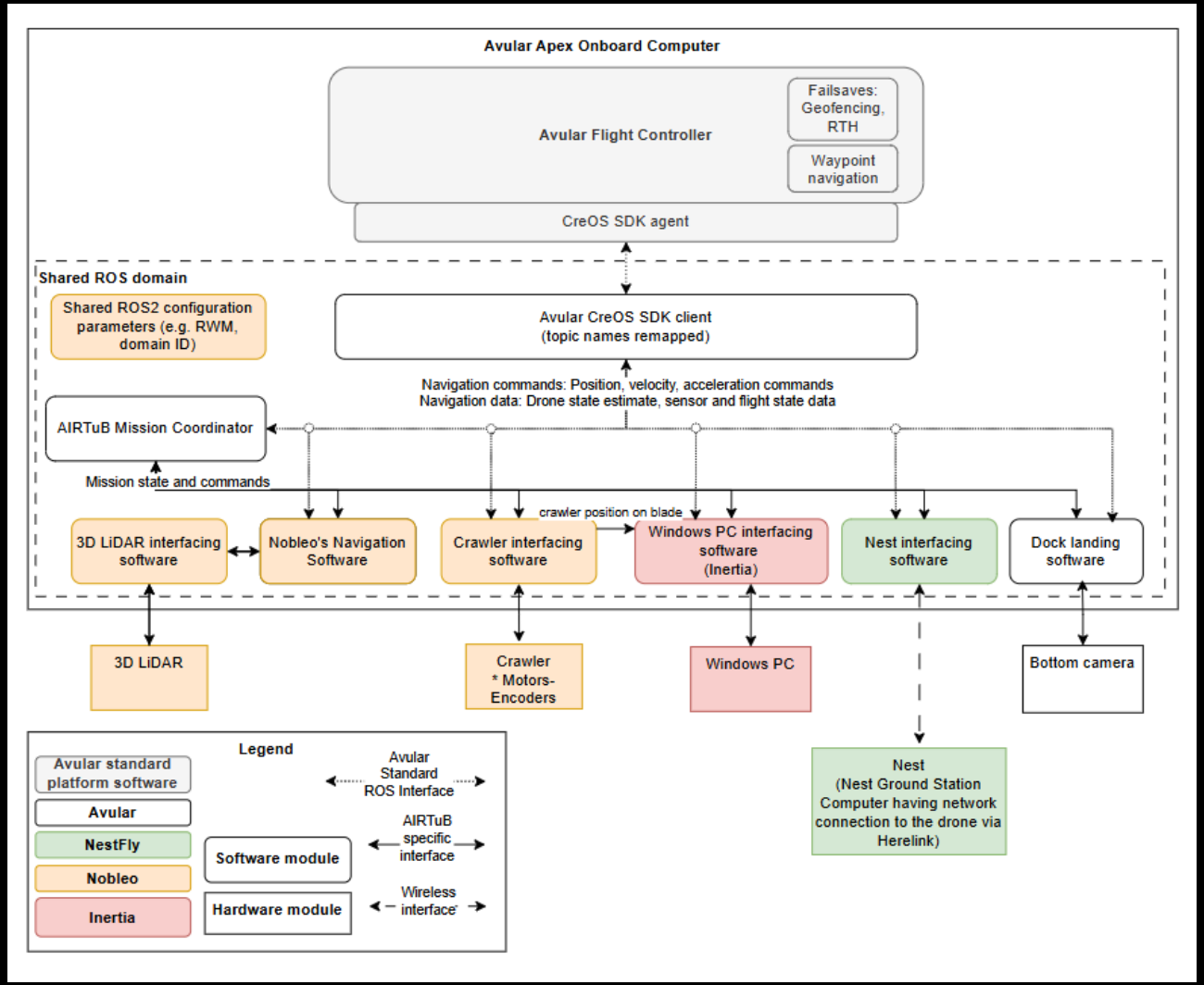
Strategic system integration – Prove reliability & safety



AIRTuB2 – Software modules

- Numerous software interfaces to orchestrate & track

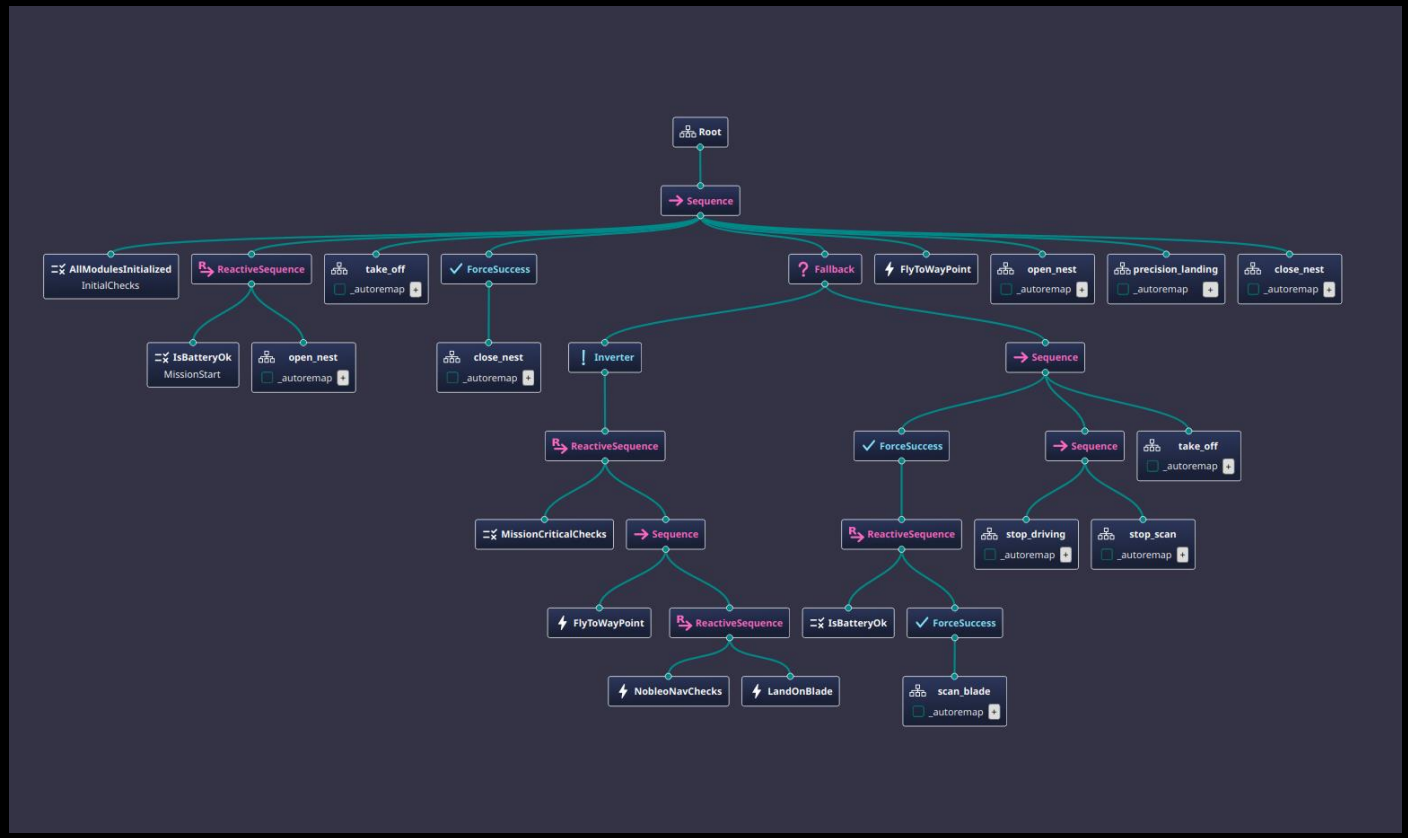
- Inherently safe drone operation
- AIRTuB mission controls drone through an API
- Does not directly intervene with flight controls
- Always keeping drone stable



Mission Coordinator

- Modular behavior tree design

- Easy to test sub-sets of the system in isolation
- Easily reconfigure based on integration insights

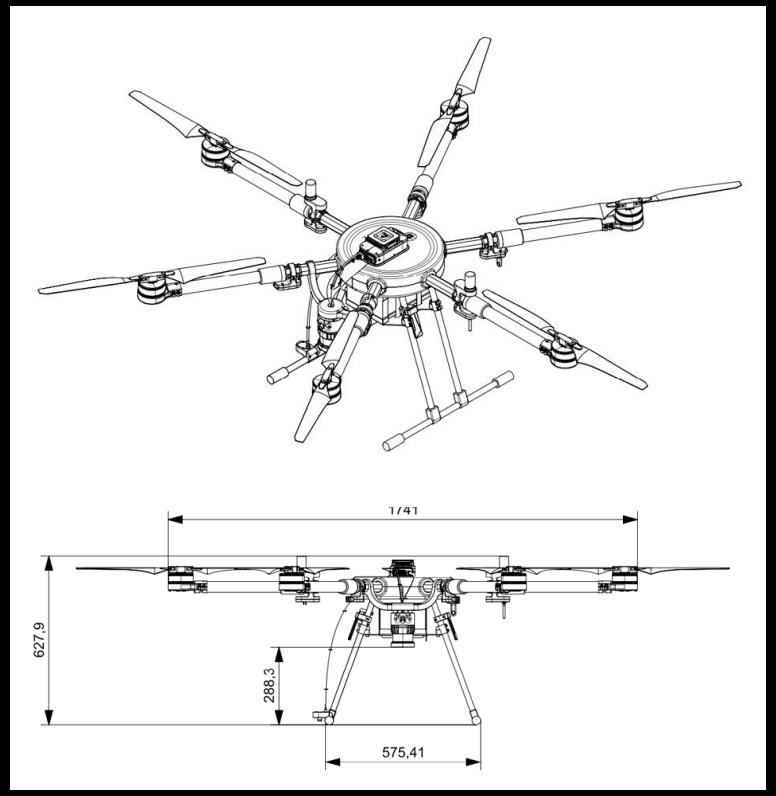


Drone specifications

- Set out to develop "system of systems" under 25 kg MTOW

- AIRTUB2 system now targeted ~35 kg MTOW
- Continuous development of Power Delivery system
  - To meet safety standards
  - Adapt to shifting scope
  - Continuous current of 150 A expected
  - Current peaks of >>200 A expected

- Avular required to upgrade platform
  - Upgrade to "Ultra high-density" battery pack(s)
  - Upgrade motor' thrust >> thrust-to-weight ratio
  - Tune Avular Flight Controller for MTOW
  - Verify inherent safe operation at MTOW



Thank you!