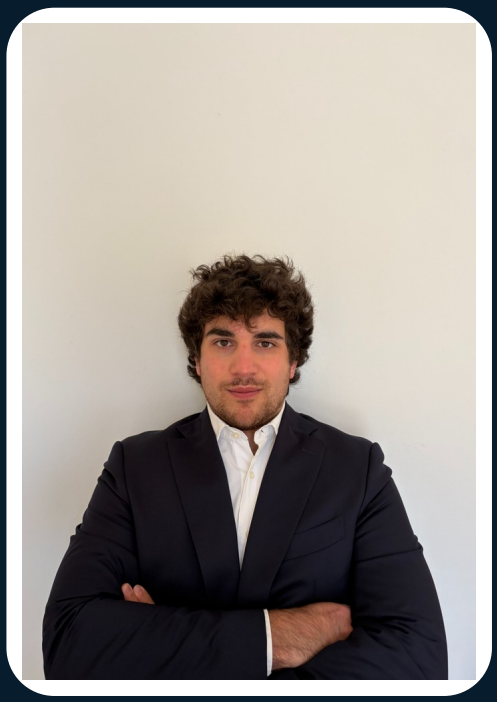
TECHNICAL PORTFOLIO / 2026

Edoardo Argenti

Aerospace Engineering MSc

ADCS | GNC | CubeSat systems



I build closed-loop attitude determination and control simulations that connect spacecraft dynamics, sensor models, estimation, actuation and mission-level pointing objectives.
Two years with Alba CubeSat ADCS - Team Leader in year two

University of Padua
MSc Aerospace Engineering

Prepared for
TUM Venture Labs Startup Career Fair
Aerospace & Defence - 03 Nov 2026

From subsystem contributor to ADCS Team Leader

ALBA CUBESAT

2U CubeSat project connected to ESA Fly Your Satellite!

2 YEARS

ADCS team

Year 2: Team Leader

The scope below is limited to information supplied for this portfolio. Mission-sensitive implementation details are intentionally omitted.

Dynamics

Spacecraft attitude dynamics and environmental disturbance models

Sensing

6 CSS, 2 FSS, 3 MEMS gyros and 2 magnetometers

Estimation

TRIAD attitude determination inside the closed loop

Actuation

Reaction wheel and magnetorquer models

Control

LQR-based pointing control

Operations

Nadir pointing and ground-station tracking objectives

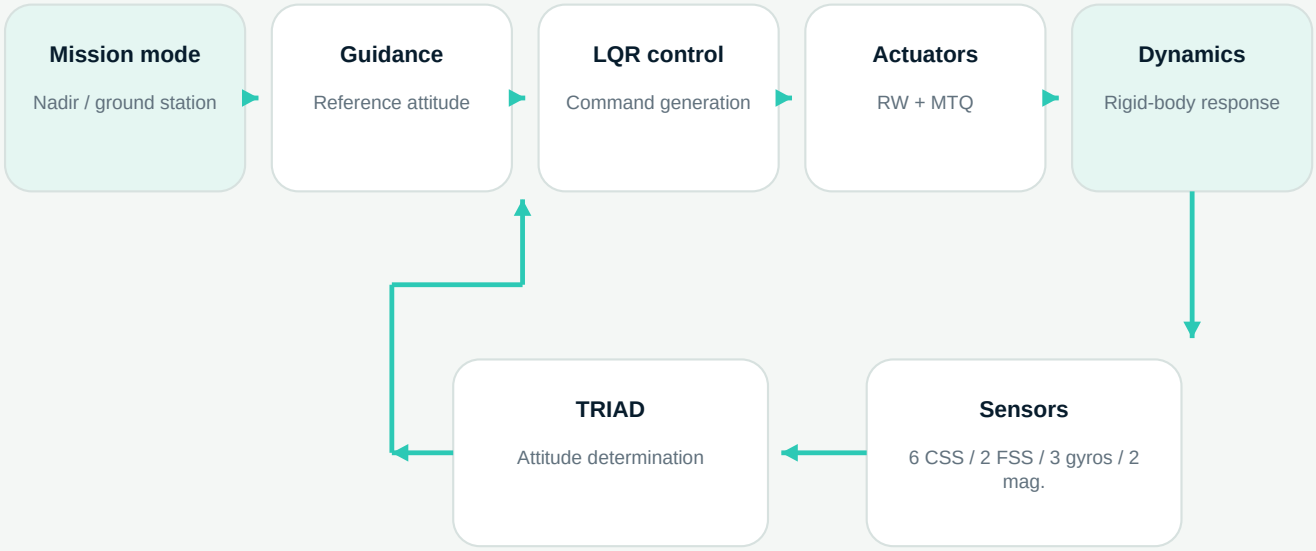
VERIFIED PROJECT REQUIREMENT

20 deg pointing requirement

Presented here as the stated system requirement. No unverified performance margin or flight result is claimed.

One simulation, end to end

A modular MATLAB/Simulink environment was used to connect the plant, environment, sensors, estimation, guidance, controller and actuators.



Disturbance models Environmental torques enter the dynamics so controller behavior is evaluated inside the full loop.

ENGINEERING EMPHASIS

01 Traceability

Keep the requirement, reference, model, output and check connected.

02 Modularity

Separate subsystems so models can mature without rewriting the full loop.

03 System thinking

Read failures across interfaces, not only within individual blocks.

Turning mission intent into actuator commands

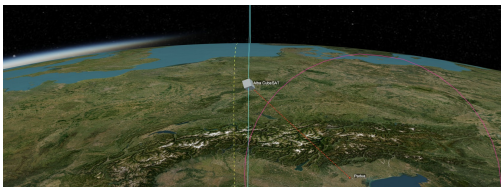
Mission modes change the reference-generation logic while preserving the estimation and control chain.

MODE A

Nadir pointing

Reference attitude aligned with the Earth-facing observation objective.

MODE B



Ground-station tracking

Line-of-sight pointing objective

01	**Define reference**	Mission geometry produces the desired attitude.
02	**Estimate state**	Sensor models and TRIAD provide attitude knowledge.
03	**Compute error**	Reference and estimated attitude close the loop.
04	**Control & allocate**	LQR commands are realized through RW and MTQ models.
05	**Evaluate**	Pointing behavior is checked against the 20 deg requirement.

A working baseline, migrating with discipline

The established MATLAB/Simulink environment is separated clearly from the Python migration in progress.

ESTABLISHED

MATLAB / Simulink

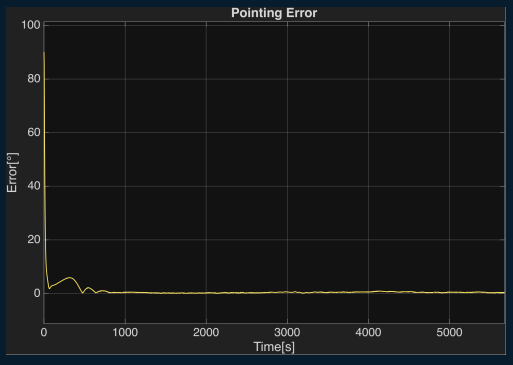
Closed-loop model integrating dynamics, disturbances, sensors, TRIAD, actuators, LQR and pointing modes.

IN PROGRESS

Python migration

Spacecraft dynamics and reaction-wheel models validated. Remaining modules are not presented as complete.

Spacecraft dynamics	VALIDATED
Reaction wheel	VALIDATED
Full Python closed loop	IN PROGRESS



NADIR POINTING

Pointing error over time

Verified plot supplied from the thesis simulation. Axes show error in degrees and time in seconds.

05 / WHAT I BRING

A system-minded engineer for small, fast teams

Target roles: ADCS/GNC, simulation, flight dynamics and spacecraft systems.

Closed-loop ownership

Connect models across the full path from mission objective to spacecraft response.

Technical leadership

Two years in the ADCS team, stepping into Team Leader responsibility in year two.

Migration mindset

Rebuild carefully in Python, validating modules before claiming end-to-end completion.

Clear communication

Make requirements, assumptions, interfaces and validation status visible.

START A TECHNICAL CONVERSATION

Ask me about...

TRIAD inside a simulated sensor chain | RW + MTQ actuation | pointing-mode logic | validation during a MATLAB-to-Python migration

CONTACT & PROFILES

CV
Download from the portfolio site

GitHub
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LinkedIn
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edoargenti@gmail.com

Confidentiality note: this portfolio is a high-level summary. It omits sensitive project implementation details and does not disclose internal data.