ROBERTO MARTINEZ DE LA CRUZ

Aerospace Engineer

9+ years of experience in aerodynamics, flight dynamics and data analysis. Optimization of aerodynamics, performance and handling qualities for commercial aircraft, UAVs and race cars through low fidelity methods, CFD simulations, flight and wind tunnel testing. Data science applied to engineering through Python.

Good communicator, team player, pragmatic.

@ robertomzc@gmail.com

+41 779 441 271

robertomzc.github.io

robertomzc

EDUCATION

UC Berkeley
MSc Thesis | 2018 – 2019

JFM Publication: *'Water impact on underside of horizontal hydrophobic plate'.*

TU Delft
MSc Aerospace | 2016 – 2019

Aerodynamics specialization.
8,85/10. Top 3%

UPM (Madrid)
BSc Aerospace | 2012 – 2016

Science and Technology specialization.
8,17/10. Top 5%

AWARDS

Justus & Louise van Effe Research Grant
TU Delft | 2018

Prof. van der Maas Fund
TU Delft | 2018

Excellence Scholarship
UCM (Madrid) | 2013

Extraordinary Award
UPM (Madrid) | 2013

EXPERIENCE

ML Application Engineering | Neural Concept
Switzerland | Jan 2025 - Present

Development of end-to-end, Python-based AI data workflows for engineering processes. CAD and CAE data pre and post processing, analysis and surrogate models building. Aerodynamics, structural and lightning simulations.

Aerodynamics Engineer (R&D) | senseFly
Switzerland | Oct 2019 – Dec 2024

Design and analysis of fixed wing UAS

eBee VISION: Aerodynamic envelope and pitot probe design. Improvement of flight time (+50%) with respect to its predecessor (eBeeX)

Tools: Development of numerical and experimental tools to design fixed wing UAS end-to-end:

- Drone design framework: In-house Python framework to design drone geometry. Wrapper over low fidelity AVL and FlightStream for aerodynamic calculations.
- Automatic CFD simulation wrapper: Python tool linking Pointwise, ANSYS Fluent, OpenFOAM & Paraview for CFD simulations
- Wind tunnel testbench and analysis: In-house test bench design and construction. Data acquisition and processing software development in Python. Aerodynamic and thermal testing campaigns.
- Flight test: Preparation of test matrix, flying prototypes (including sensors as 5-hole pitot). Flight data analysis pipeline based on Python, AWS and Kibana and Elasticsearch.

Teaching Assistant | TU Delft
Netherlands | Apr - Jun 2018

Teaching Assistant in two courses of the Aerospace Bachelor's degree:

- Computational Modelling
- Simulation, Verification and Validation

Aerodynamics Intern | Renault Formula 1 Team
United Kingdom | Jan - Jul 2017

Particle Image Velocimetry (PIV) system calibration, synchronization and post processing at Enstone's wind tunnel.

Aeroelasticity Intern | AIRBUS
Spain | Mar - Jun 2016

Horzontal and Vertical Tail Plane (HTP & VTP) loads calculation during transport. Loads and Aeroelasticity Department.

COMPLEMENTARY EDUCATION & VOLUNTEERING

Formula Student Team Delft | TU Delft

Delft, Netherlands | Sept 2016 - Jan 2017

Member of the 2nd-ranked Formula Student team worldwide.
Design and manufacturing of carbon fiber aero structures. Mouldless preimpregnated fibers (prepreg) technique developed. Cut 50% mould costs, improved surface finish.

Formula Student/SAE UPM Racing | Politécnica de Madrid (UPM)

Madrid, Spain | 2014 - 2016

2015/16: Frame and Aerodynamics division team leader:

- 9 people group, finances and sponsorships management.
- Front and rear wing aerodynamic and composite design, assembly and validation. Manufacturing via Resin Transfer Moulding (RTM).
- Steel space frame TIG welding.

2014/15: Member of the Frame and Aerodynamics division

- Aerodynamic studies of bodywork and wings.
- Pedal Box aluminum design and optimization.
- Carbon fiber wet lay-up (bodywork, wings).

Workaway Volunteer

Southeast Asia | Sep – Nov 2017

2,5 months trip in Thailand, Malaysia, Singapore and Sumatra, including 2 volunteerings:

- **Mason Work**: Construction of an eco-campsite for marine conservation. Tioman Island, Malaysia.
- **English Teacher:** English teacher for kids from 7 to 22 years old. Nias, Sumatra, Indonesia.

LANGUAGES

Spanish	Native
English	C2
French	C1
Italian	A2
German	A1

INTERESTS

Triathlon
AlpsMan Xtrem 2024 finisher

Climbing

Science outreach

RC Aircraft

Cooking

STACK

Solidworks	Parts, drawings and assembly generation. FEA Simulation
CATIA	Surface, part, assembly modules. Skeleton methodology
OpenFOAM	Aerodynamic steady simulation. Turbulence modelling y+~1.
ANSYS	CFX, Fluent and Ensight. Aerodynamic & thermal simulations
STAR CCM+	Low Reynolds number studies for UPM Racing's wings
Pointwise	Generation and automatization of aircraft CFD meshes
ParaView	Results analysis. Automatic extraction of scenes and data.
Python	Development of a framework for the design, analysis and calculation of fixed wing planes. Data analysis, geometry generation, software API interfaces, front end development. Numpy, Pandas,Pyvista, Tensorflow, Solara, iPywidgets ...
C++	Basic knowledge. Advent Calendar challenge 2023
MATLAB	Script and Simulink programming. Multiple years of experience. i.e. temporal temperature simulation and closed loop controller.