Flight Dynamics Simulation Engineer (f/m/d)

Permanent employee, Full-time · Munich

TYTAN Technologies

TYTAN is a young deep-tech defense startup that develops a cost-effective counter-drone solution to protect people and critical infrastructure. We are an international team of ambitious engineers who combine expertise in autonomous systems and UAV design.We are looking for a **Flight Dynamics Engineer** to own and advance the fidelity of our in-house flight simulation environment. You will be responsible for refining existing flight dynamics models, developing new ones, and ensuring that our simulations match the real-world behavior of our UAV platforms as closely as possible.Your work sits at the intersection of **flight mechanics, aerodynamics, propulsion, software, and flight testing**. You will not only improve models, but also design and execute flight tests, analyze real-world data, and continuously close the gap between simulation and reality.This role requires **relevant prior experience** and a strong, pragmatic engineering mindset.

Your roadmap to make an impact

- Refine, extend, and maintain **high-fidelity flight dynamics models** for our UAV platforms.

- Develop new **nonlinear 6-DOF flight dynamics models** across the operational flight envelope.

- Model and improve the realism of:

  - Aerodynamics

  - Atmosphere and environmental effects

  - Propulsion systems

  - Motors, powertrain, and propellers

  - Actuators and control effectors

- Validate and tune models using **real flight test data.**

- Apply **system identification and parameter estimation techniques** to reduce the gap between simulation and real aircraft behavior.

- Design, plan, and execute **flight test campaigns** to generate the data required for model calibration and validation.

- Analyze logged flight data to identify discrepancies, sensitivities, and model weaknesses.

- Maintain and evolve model implementations (currently **Python**, with potential future migration to **C++**).

- Collaborate closely with GNC, systems, and hardware teams to ensure consistency between models and real vehicles.

- Clearly document modeling assumptions, limitations, and validation results for internal use.

Who you are

- Several years of relevant experience in **flight dynamics, aircraft modeling, or aerospace simulation.**

- Strong theoretical foundation in:
  - Flight mechanics
  - Aerodynamics
  - Rigid body dynamics
  - Propulsion systems

- Experience with **fixed-wing, multirotor, and/or VTOL aircraft flight dynamics.** *(our models cover both fixed-wing and multirotor platforms)*

- Proven hands-on experience working with **real aircraft or UAVs.**

- Experience validating flight dynamics models against **real flight test data.**

- Experience performing **trim calculations, linearization, and stability analysis** for fixed-wing, multirotor, and/or VTOL aircraft.

- Comfortable designing and executing **flight test campaigns.**

- Experience with **flight dynamics modeling, system identification, or handling qualities analysis.**

- Strong programming skills in **Python and C++.**

- Familiarity with simulation environments, modeling frameworks, or numerical analysis tools.

- A pragmatic, experience-driven mindset — model correctness and predictive accuracy matter more than elegance.

- **Hands-on UAV experience is a strong plus.**

- Experience matters more to us than academic perfection.

Why TYTAN?

- Be the first to welcome the world into a deep-tech defense startup that is shaping the future of security.

- Work in a fast-paced, international team where your contributions truly matter and your impact is immediate.

- Participate in our success with stock options.

- Be part of something bigger in a mission driven company.

- Enjoy flexible working hours.

- Access to EGYM Wellpass sports facilities.

- All day coffee and snacks, team events, and a modern office in Munich.

About us

At TYTAN, it is more than just a job; it is about embracing autonomy, personal growth, and purpose. Make a lasting impact in the new era of defense! Join us to create a safer world for all.

TYTAN is an equal-opportunity employer committed to fairness and inclusivity. We do not prioritize any specific religion, gender, nationality, or background. Due to security clearance requirements, affiliations with countries listed under § 13 para. 1

no. 17 SÜG may affect the application process. All qualified applicants are encouraged to apply.

Please apply here: https://tytan-technologies-gmbh.jobs.personio.de/job/2509566?language=en&display=en