Fidel Echevarría

Aerospace Engineer

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Aerospace & Avionics Engineer with +10 years of experience specializing in GNC, sensor fusion, navigation systems, and safety-critical architectures (Airbus Defence & Space, UAV Navigation). Proven expertise in applying Computer Vision, Generative AI, and Machine Learning to solve engineering problems. Full-stack maker passionate about autonomous systems and vehicle automation.

Experience

since nov24 **Aerial Refueling Systems Engineer**, *Airbus Defence and Space*, Madrid

End-to-end development and full lifecycle supervision of certified ARBS refueling systems. Key contributions:

- Requirement specification, software V&V, and lifecycle supervision of safety-critical ARBS avionics.
- AI/ML application to safety-critical systems, sensor telemetry, fault monitoring, and kinematic anomaly detection.
- Sensor fusion algorithms development for precise relative 3D positioning during naval landing operations.
- Photorealistic 3D simulators and generative AI models for synthetic data generation and receiver trajectory simulation.
- Testing platform improvements, operational data analysis tools, and electrical schematics reviewing.
- In-service engineering follow-up, customer technical support, and formal certification documentation.

feb22-nov24 **Navigation & Sensors Development Engineer**, *Airbus Defence and Space*, Madrid

Working at the avionics center of competence for medium and light military transport aircraft programs:

- Navigation systems design, integration, V&V, certification, and qualification.
- Concept definition for airborne architectures for new and retrofitted navigation systems.
- Technical support for queries raised by aircraft operators and cross-domain departments.
- Participation in R&T projects related to GNSS-denied navigation technologies and AI applications for precise IRS error characterization.

jun16-feb22 **Flight Control Engineer - Sensor Fusion**, *UAV Navigation*, Madrid

Software development of state estimation solutions and R&D projects in computer vision for autonomous UAVs:

- Sensor fusion algorithms for aircraft dynamic state estimation.
- Computer vision systems applied to autonomous aircraft navigation and precision positioning in GNSS-denied environments.
- High-fidelity simulation: flight dynamics, kinematics, atmospheric disturbances, and flight control law design.
- Sensor calibration algorithms, automated test suites, international client support, and internship mentorship.

sep15-jun16 **Flight Control Engineering Intern**, *UAV Navigation*, Madrid

Involved in the software development, modeling, and validation process of aircraft simulators and flight control systems.

Education

sep19-sep21 **M.Sc. Research in Artificial Intelligence**, *Universidad Nacional de Educación a Distancia (UNED)*

Key subjects: Bio-inspired neural methods, evolutionary computation, computer vision, perceptual and autonomous robotics, machine learning methods, research methodology for intelligent systems.

Thesis: *Artificial intelligence methods for identification of aerodynamic coefficients from flight data.*
Link: `https://fidelechevarria.github.io/MSc-Thesis.pdf`

oct18-jun19 **Self-Driving Car Engineering Nanodegree**, *Udacity*

Key subjects: Deep learning, computer vision, sensor fusion, localization, model predictive control, optimal path algorithms, system integration (ROS).

sep10-sep16 **B.Sc. Aerospace Engineering**, *Universidad Politécnica de Madrid (UPM)*

Key subjects: Mechanical design, flight mechanics, aerodynamics, fluid mechanics, thermodynamics, aerospace materials, structures, electronics, project management, aerospace propulsion.

Thesis: *Design of a Flight Control System Optimization Tool for Aerial Vehicles.*
Link: `https://fidelechevarria.github.io/BSc-Thesis.pdf`

Languages

Spanish (Native), **English** (Fluent, CEFR C1), **French** (Basic, CEFR A2).

Skills

Core & Avionics Engineering. Aircraft avionics systems, GNC, sensor fusion (Kalman filtering), state estimation, dynamic system simulation, systems V&V, embedded software, C/C++, Python, Rust, MATLAB, Simulink, Fortran, R, Linux, Bash, Git, SVN, CATIA.

AI, Computer Vision & 3D Graphics. PyTorch, TensorFlow, OpenCV, CUDA, VAEs, LLMs (Gemini, Claude, GPT), LangChain, Three.js, Google Filament, WebGL, Blendshape & Viseme modeling, photorealistic rendering, synthetic data, vector databases (Pinecone), serverless AI (Modal, RunPod, GCP).

Full-Stack & Product Development. Web & mobile development, rapid product prototyping, React, TypeScript, JavaScript, Dart, Flutter, Supabase, Firebase, Cloudflare, Redis, Vercel, Resend, Firecrawl, CI/CD, UI/UX design.

Inventions

2024 F. Echevarría Corrales, J. V. González Calatayud, "Vision-based algorithm for relative 3D position estimation using equilateral triangles vertices as terrain-fixed landmarks,". Airbus Defence and Space patent. [Patent Link]

Publications

2020 F. Echevarría Corrales, J. M. Pulido Fernández and M. A. de Frutos Carro, "Efficient visual navigation applied to unmanned aerial systems in GNSS-denied environments," presented at the 8th Annu. National R&D Security and Defence Conf. (DESEi+d), León, Spain.

Advising

2023 J. V. González Calatayud. M. Sc. Thesis in Aeronautical Engineering (UPV / Airbus): "Vision based navigation for precision landing". Honored with 1st prize at Excellence in Engineering Internship Awards (INECO/REDFUE).

2019 F. J. González-Vico Puertas. B. Sc. Thesis in Industrial Technology Engineering (UPM / UAV Navigation): "UAV positioning using infrared machine vision". [Thesis Link]

Projects

since 2021 **Independent software creator and AI engineer.** Designing, building, and shipping full-stack AI-powered software products and micro-SaaS applications end-to-end. Focused on rapid prototyping, computer vision, product analytics, and automated workflows. Link: `https://indiepa.ge/fidel`

- Showprogress & Chattier: AI-driven developer automation tools and multilingual conversational support avatars (Three.js, Google Filament, blendshape & viseme modeling).
- Lima: Computer vision accessibility software controlling PC interfaces via facial expression and head-movement tracking.
- Padelkit & Padelamix: AI video analytics frameworks and core foundations for sports tracking and motion analysis.
- Hairstyle View & PlotPink: Specialized visualizers for retail AI simulation and high-performance engineering data plotting.

feb18-sep18 **Aircraft Trajectory Optimization.** Analysis tool for optimal aircraft trajectory estimation in Red Bull Air Race World Championship (Open-Source). [Project Link]

Additional Training

2021 **Avionics Ecosystem: DO-178C, DO-254 & ARP 4754A**, *AFuzion*, Vance Hilderman

2018 **Python Courses**, *Packt Publishing*

2017 **RPAS Pilot Certification**, *Cinetic Plus*, Madrid

2015 **Advanced CATIA V5 Certification**, *ETSIAE (UPM)*, Madrid

2014 **MATLAB Course**, *ETSIAE (UPM)*, Madrid