Drottninggatan 67 / 1301, 111 36
Stockholm, Sweden

+34 636-149-592
viktornfa@gmail.com
linkedin.com/in/victornfa

Victor Nan Fernandez-Ayala

Professional Experience

2022-present **PhD student**, Div. of Decision and Control Systems at *KTH Royal Institute of Technology*, in *Stockholm, Sweden.*

- Focused on multi-agent systems, human-in-the-loop and safety-critical control.
- Involved with Digital Futures Smart Construction and EU CANOPIES precision agriculture project.
- Wallenberg AI, Autonomous Systems and Software Program (WASP) affiliated PhD student.
- Research projects: SHARCEX (underwater diver-robot collaboration), Digital Futures Smart Construction (digital twins + automation for construction robotics) and EU CANOPIES (precision agriculture human-in-the-loop planning and control).

2024-2025 **Co-Founder & CTO** at Animum, in *Stockholm, Sweden***.**

- Raised funding, built and led a small team, and owned the technical roadmap and delivery.
- Developed an integrated robotic solution for autonomous night-time supermarket shelf stocking and fronting ("Fronta") using mobile manipulators.
- System integration across perception, planning and control for manipulation in a retail environment; with demo and validation on a mock-up store.

2021-2022 **Research engineer at the SML (*Smart Mobility Lab*)** from **KTH University,** in *Stockholm, Sweden*.

- Part-time research engineer (**amanuens**) for the Division of Decision and Control Systems.
- Working on assistant and coordinating roles on the experiments conducted at the lab.

2019-2020 **Engineering Intern at Drone Hopper** (*drone-hopper.com*) in *Madrid, Spain*. Working in programming and developing autopilots and controllers for heavy lifting drones.

- **Creation of a drone simulator** with *ROS & Gazebo* to facilitate testing new controllers. **Coding a custom software** based on *ArduPilot*. **Design and creation of a multirotor prototype**.

2019-summer **Intenship at Continental Automotive**, in *Timișoara, Romania.* Working as a junior programmer and electronics.

- **Creation of a capacitance measurement device.** Circuit design and simulation using *LTspice* software, PCB design using *Autodesk Eagle* and creation and programming of the device using *JavaScript*.

Journals

Submitted Nan Fernandez-Ayala V., Deka S. A. and V. Dimarogonas D. "Estimating unknown dynamics and cost as a bilinear system with Koopman-based Inverse Optimal Control". IEEE Transactions on Automatic Control, 2026.

2025-Jun Nan Fernandez-Ayala V., Silva J., Guo M. and V. Dimarogonas D. "Robust Visual Servoing under Human Supervision for Assembly Tasks". European Journal of Control (EJC), 2025.

Conferences

Submitted Peron D., Nan Fernandez-Ayala V. and Segelmark L. "From Pixels to Shelf: End-to-End Algorithmic Control of a Mobile Manipulator for Supermarket Stocking and Fronting". 2026 IEEE International Conference on Robotics and Automation (ICRA).

2025-May Peron D., Nan Fernandez-Ayala V., Vlahakis E. E. and V. Dimarogonas D. "Efficient Coordination and Synchronization of Multi-Robot Systems Under Recurring Linear Temporal Logic". 2025 IEEE International Conference on Robotics and Automation (ICRA), Atlanta, USA.

2024-Aug Shankar A. D., Sujet P., Matoses Gimenez A., Nan Fernandez-Ayala V., Wong R., Yu P., Tan X. and V. Dimarogonas D. "Enhancing Precision Agriculture Through Human-in-the-Loop Planning and Control". 2024 IEEE Conference on Automation Science and Engineering (CASE), Apulia, Italy.

2024-May Zhang Y., Nan Fernandez-Ayala V. and V. Dimarogonas D. “Multi-robot Human-in-the-loop Control under Spatiotemporal Specifications”. 2024 IEEE International Conference on Robotics and Automation (ICRA), Yokohama, Japan.

2023-May Nan Fernandez-Ayala V, Tan X and V. Dimarogonas D. “Distributed barrier function-enabled human-in-the-loop control for multi-robot systems”. *2023 IEEE International Conference on Robotics and Automation (ICRA),* London, UK.

2022-Sep Nan Fernandez-Ayala V, Vimlati L, Matoses Gimenez A, Delmotte H, Ivchenko M and Mariani R. “Design of a HALE UAV for atmospheric imaging”. *33rd Congress of the International Council of the Aeronautical Sciences*, Stockholm, Sweden, 2022.

Theses

2025-March Nan Fernandez-Ayala V. “Distributed planning and control of multi-robot systems under human presence”. KTH Licentiate thesis (monograph) in Electrical Engineering, 2025.

2022-Jun Nan Fernandez-Ayala V. “Control barrier function-enabled human-in-the-loop control for multi-robot systems: Centralized and distributed approaches”. KTH MSc thesis: Degree Project in Electrical Engineering, specializing in Systems, Control and Robotics, 2022.

Academics

2020-2022 **Master of Science in Aerospace Engineering**, at *KTH Royal Institute of Technology*, in *Stockholm, Sweden*.

- **Specialized in Systems and Controls** (Systems Engineering, Hybrid & Embedded Control, Geometric Control, Non-linear Optimization, Advanced Control, Optimal Control and Reinforcement Learning).
- **Master Thesis:** Control barrier function-enabled human-in-the-loop control for multi-robot systems.
  - Focused on formation control and platooning with STL with a human element.
  - Working on designing and implementing a decentralized version of the CBF algorithm.
  - Testing with Nexus robots and Qualisys motion capture system as well as *ROS*.

2016-2020 **Aerospace Engineering major**, at *Universidad Carlos III de Madrid* (4-year program taught entirely in English).

- Final average grade of **8.473** out of 10. Outstanding grade at (passed with honors):
  - **Programming** (**Programación**)
  - **Control System Analysis and Design** (**Control de Sistemas Aeroespaciales**)
  - **Jet & Rocket Propulsion** (**Propulsion Aeroespacial I**)
  - **Circuit Analysis** (**Fundamentos de Ingeniería Electrónica**)
  - **Transportation Planning & Design** (**Navegación, Transporte Aereo y Aeropuertos**)
- **End-of-Degree Project:** creation of a realistic Python-based platform to simulate autonomous air vehicles and analyze the future of UTM (Unmanned Traffic Management).

2018-2019 **Exchange student** for one year at ***Georgia Institute of Technology***, in *Atlanta, USA*.

2014-2016 **Baccalaureate** at *I.E.S Colegio San Agustín, Santander, Spain*. **Grade**: 13.136 out of 14 (Access Exams to college).

Teaching

2023-present EA236X Degree project in electrical engineering, master thesis. **KTH University**.

- Yixiao Zhang: “Multi-robot coordination and planning with HIL under STL specifications”.
- Davide Peron: “Multi-Robot Coordination for Precision Agriculture Under Recurring LTL”.
- Jorge Silva: “Object Manipulation with Robust Visual Servoing under Human Supervision”.

2023-2025 EL2520 Control Theory and Practice, Advanced Course (teaching and lab assistant). **KTH University**.

2022-2025 EF112X Degree project in electrical engineering, basic level (thesis supervisor). **KTH University**.

2022-2023 EL1010 Control technology, general course (teaching and lab assistant). **KTH University**.

Leadership & Organizations

2020-present Team leader in the **student research project ALPHA** (*kthaero.com/alpha*) from **KTH University**.

- A **HALE** (High Altitude Long Endurance) **UAV** designed to fly in the Arctic to image auroras and other atmospheric effects. Done in collaboration with the **Space and Plasma physics department** at KTH.
- Aircraft design, CAD modelling with *Solid Edge, CFD* with *Fluent* and electronics & control with *Ardupilot*.

2020-present Team member in the **BOOMERANG REXUS 31 team** (*kthaero.com/boomerang*) from **KTH**. Working on creating an autonomous controller using *MATLAB/Simulink* and aircraft/paraglider design with *XFLR5* and other tools.

2020-2021 Team member in the **B2D2 REXUS team** (*b2d2.se*) from **KTH**. Participating in the **German-Swedish student programme REXUS/BEXUS 30** (*rexusbexus.net*). Working in the ADCS (Attitude Determination and Control System) in *Simulink*, as well as software implementation and testing with *STM32 (C code)* and *FPGAs (VHDL)*.

2019-2020 Member of **STAR UC3M** (*staruc3m.com*) student rocketry team. Developing telemetry and sensor reading software for High-Power Rockets as well as the software for POSE and orientation estimation with Kalman filters.

2018-2019 Member of the **Ramblin' Rocket Club** (*rocket.gtorg.gatech.edu*), university organization at Georgia Tech with the goal of designing, building and flying rockets. In charge of building a L1 High-Power Rocket.

Academic awards & Scholarships

2020-2022 **Scholarship** from *Svensk-Spanska Stiftelsen*, obtained during the first and second year of the aerospace master.

2019-2020 **Excellence Grant** from *Fundacion Botín*, obtained during my aerospace studies of the fourth year.

2018-2019 **UC3M mobility grant**, *Universidad Carlos III de Madrid,* for studies abroad during my third year.

2017-2018 **Excellence Grant** from *Fundacion Botín*, obtained during my aerospace studies of the second year.

Courses & Workshops attended

2020-present **Deep Learning specialization** by *deeplearning.ai*, online specialization at Coursera consisting of five courses (**Neural Networks and Deep Learning**. **Improving Deep Neural Networks: Hyperparameter tuning, Regularization and Optimization**. **Structuring Machine Learning Projects**. **Convolutional Neural Networks**. **Sequence Models**). *coursera.org/share/6889b091da7ff8bce7f0d4f634411dd3*.

2018-2019 **Machine Learning** by *Stanford University*, online course at Coursera focused on anti-spam, image recognition, clustering and building recommender systems. *coursera.org/account/accomplishments/verify/56SAFVU6AEP8*.

Languages

English	Proficient level	*Cambridge CAE (2016)/TOEFL iBT: 114 (2019)*
Spanish	Proficient level	*Native*
Romanian	Proficient level	*Native*
Swedish	Limited working level	*B1*

Software & Tools

PROGRAMMING LANGUAGES & CODING EXPERIENCE: |Python| |MATLAB/Simulink| |C/C++|

OFFICE SOFTWARE & TEXT: |Office| |LaTeX|

SIMULATION: Fluids/Aerodynamics |Ansys Fluent| |XFLR5| |Simscale| and **Robotics** |ROS1/2| |Gazebo|

DESIGN: 3D Modelling |SolidEdge/SolidWorks|, **3D Printing** |Cura| and **PCB Design** |KICAD|

HARDWARE/SOFTWARE: Robotics |Arduino| |Raspberry Pi| |STM32| and **Autopilots** |ArduPilot/Pixhawk|

CERTIFICATIONS: |EASA Drone License A1-A3 (EUROCONTROL)| and |EASA Drone License A2 (AESA)|