

PERSONAL INFORMATION

Franco Fusco

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 [francofusco.github.io](https://github.com/francofusco)

Date of birth 24 August 1993 | Nationality Italian



WORK EXPERIENCE

Mar 2022 – Present

Research & Development Engineer

Employer Neurodec (neurodec.ai). Business Pôle, 1047 route des Dolines, Allée Pierre Ziller, 06560 Valbonne - France

Contacts Kostiantyn Maksimenko, CEO kostiantyn.maksymenko@neurodec.ai

Main Activities Development and maintenance of the *Myoelectric Digital Twin*^{*}, a Python software for the simulation of electrical activity during muscular contractions. Among others, the scope of work encompassed implementing strategies and algorithms proposed in academic papers, prototyping proofs of concepts that required the use of specialized hardware, documenting and fixing bugs. Notable software libraries and infrastructures employed in the tasks listed above included PyTorch, SQLAlchemy, Flask, CGAL. The programming language utilized on a daily basis was Python, with sporadic use of C++.

^{*}Maksymenko *et al.*, "A myoelectric digital twin for fast and realistic modelling in deep learning." Nature Communications 14.1 (2023): 1600.

Sep 2021 – Feb 2022

ATER (IUT Nice Côte d'Azur & I3S), Section 61

Employers IUT Nice Côte d'Azur (iut.univ-cotedazur.fr). 41 Boulevard Napoléon III, 06206 Nice - France; I3S - UMR7271 - UNS CNRS (i3s.unice.fr). 2000 route des Lucioles - Les Algorithmes - bât. Euclide B, 06900 Sophia Antipolis - France

Teaching Activities 180+ teaching hours of lectures and practical sessions. Subjects: Linear Control Theory, C Programming, Object-Oriented Programming in C#, Linear Algebra, Reinforcement Learning for Robotics.

Research Activities Development of advanced control algorithms based on a hybrid model-based and data-driven approach, where control techniques and algorithms from the Model Predictive Control literature are used in conjunction with Deep-Neural-Networks.

Dec 2020 – Aug 2021

Post-doctoral Research on Advanced Robot Control

Employer I3S - UMR7271 - UNS CNRS (i3s.unice.fr). 2000 route des Lucioles - Les Algorithmes - bât. Euclide B 06900 Sophia Antipolis - France

Main Activities Development of advanced control algorithms based on the Model Predictive Control (MPC) strategy, tailored for highly nonlinear systems with fast dynamics and limited computational power. Example applications include the control of Unmanned Aerial Vehicles (UAVs).

Oct 2017 – Nov 2020

Lab Assistant Teacher

Employer Centrale Nantes

Main Activities Assistant instructor for several practical sessions of the local robotics master ranging from C++/Python programming to robot control in Matlab/Simulink and visual servoing with ViSP.

Mar 2017 – Aug 2017

Master Thesis Internship

Employer Airbus Group Innovations, 1 rue Roger Janin, 80300 Méaulte (France)

Main Activities Development of planning algorithms for a dual-arm robot under geometric loop-closure and integration of the system with ROS.

Oct 2013 Scientific Animator

Employer Festival della Scienza, Genova (festivalcienza.it)
Main Activities Interactive workshop addressed to children aged between 5 and 10, to introduce them to the topic of algorithmic thinking and problem solving.

EDUCATION AND TRAINING

Oct 2017 – Nov 2020 Ph.D. Student in Robotics

Institution LS2N, Centrale Nantes (ec-nantes.fr), 1 rue de la Noë, 44321 Nantes, France
Subject Dynamic Visual Servoing for Fast Robotic Arms
Supervisors Philippe Martinet, Directeur des Recherches, INRIA Sophia Antipolis philippe.martinet@inria.fr
Olivier Kermorgant, Associate Professor, LS2N Nantes olivier.kermorgant@ls2n.fr

Sep 2015 – Aug 2017 European Master in Advanced Robotics (EMARO+)

Institutions Università degli Studi di Genova (Italy) & École Centrale de Nantes (France)
Thesis project Obstacle and Self-collision Avoidance with a Dual-arm Manipulator
1st year GPA: 95.3/100 Class ranking: 2nd
2nd year GPA: 94.0/100 Class ranking: 1st
Main subjects Modeling of serial and parallel robots; Mobile robotics; Computer vision and visual servoing; ROS; Linear and non-linear control of multi-variable systems

Oct 2012 – Nov 2015 Bachelor of Science in Mechatronics Engineering

Institution Università degli Studi di Padova (Italy)
Thesis project Data Acquisition System for a Line-scan-camera of the Freescale-Cup Vehicle
GPA: 29.3/30, graduated *cum laude*
Main subjects Systems and control theory; Digital and analog electronics; Mechanics; Electrical actuators; C and Java programming languages

PERSONAL SKILLS

Mother tongue Italian

Other languages	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
French	C1	C1	C1	C1	C1
English	C1	C2	C1	C1	C1
Spanish	A1	A1	A1	A1	A1

Levels: A1 and A2: Basic user – B1 and B2: Independent user – C1 and C2: Proficient user
[Common European Framework of Reference for Languages](https://europa.eu/europass/levels)

Communication skills Good communication skills, gained through my experience as student representative in Padua University and successively as an assistant instructor for the master in robotics at Centrale Nantes, where I was also asked to give a practical lecture on sampling-based path planning.

Organisational / managerial skills Good organizational skills, thanks to a three years long experience of leadership as cub-scout master and as the organizer of a cycle of students seminars during my second year of PhD.

Computer skills Programming languages: proficient with Python and C++; familiar with Matlab and Java
Operating Systems: Linux, MS Windows
Documentation: L^AT_EX, MS Office
Robot SW Development and Simulation: ROS, ViSP, Gazebo, V-Rep, Simulink

Interests Photography, hiking, scuba-diving, skiing, 3D printing

ADDITIONAL INFORMATION

- Presentations**
- Presentation of the paper “*Improving Relaxation-based Constrained Path Planning via Quadratic Programming*” at the conference IAS 2018 in Baden-Baden, Germany.
 - Presentation of the paper “*A Comparison of Visual Servoing from Features Velocity and Acceleration Interaction Models*” at the conference IROS 2019 in Macau, China.
- Publications**
- [1] S. Israilov, L. Fu, J. Sánchez-Rodríguez, F. Fusco, G. Allibert, C. Raufaste, and M. Argentina. *Reinforcement learning approach to control an inverted pendulum: A general framework for educational purposes*. In Plos One, 2023.
 - [2] F. Fusco, G. Allibert, O. Kermorgant and P. Martinet. *Benchmarking nonlinear model predictive control with input parameterizations*. In 2022 26th International Conference on Methods and Models in Automation and Robotics (MMAR), 2022.
 - [3] F. Fusco, O. Kermorgant and P. Martinet. *Integrating Features Acceleration in Visual Predictive Control*. In IEEE Robotics and Automation Letters, 2020.
 - [4] F. Fusco, O. Kermorgant and P. Martinet. *A Comparison of Visual Servoing from Features Velocity and Acceleration Interaction Models*. In IEEE/RSJ International Conference on Intelligent Robots and Systems, 2019.
 - [5] F. Fusco, O. Kermorgant and P. Martinet. *Constrained Path Planning using Quadratic Programming*. In IEEE/RSJ International Conference on Intelligent Robots and Systems, 2018.
 - [6] F. Fusco, O. Kermorgant and P. Martinet. *Improving Relaxation-based Constrained Path Planning via Quadratic Programming*. In International Conference on Intelligent Autonomous Systems, 2018.
 - [7] N. Arnaldi, C. Barone, F. Fusco, F. Leofante and A. Tacchella. *Autonomous driving and undergraduates: an affordable setup for teaching robotics*. In Proceedings of the 3rd Italian Workshop on Artificial Intelligence and Robotics, 2016.