## CONTACTS

# Hélénon François - PhD in AI applied to collaborative robotics


*Email :* francois.helenon@wanadoo.fr
*Webpage :* https://fhsup.github.io/


## ACADEMICAL BACKGROUND

nov. 2018- jan. 2022 **PhD**

*PhD of HESAM University*

Cognitive robotic architecture for human-aware interactive task learning. An application to human-robot collaboration in Industry 4.0.

2016-2018 **Engineering degree from École Supérieure d'Electricité and M.Sc. (MFA) from Lorraine University**

*Jointly done in CentraleSupélec and Lorraine University*

Training in Artificial Intelligence and interactive systems (machine learning, autonomous robotics, signal processing, stochastic calculus, ...)

2015-2016 **Bachelor in mathematics**

*Besançon University (remote courses)*

2014-2016 **Engineering degree from Arts et Métiers**

*Arts et Métiers Sciences and Technology*

Broad theoretical and practical training in mechanical, industrial and material engineering

2011-2014 **Preparatory classes**

*Condorcet and Raspail high schools*

Intensive study courses in mathematics and physics preparing for the Grandes Écoles competitive entrance examinations (highly-selective French institutions)

## SELECTION OF PROFESSIONAL EXPERIENCES AND ACADEMIC PROJECTS

nov. 2018- jan. 2022 **PhD in AI applied to industrial collaborative robotics and teaching**

*Arts et Métiers Sciences and Technologies at LISPEN | Supervisors: Olivier Gibaru, professor | Stéphane Thiery and Eric Nyiri, assistant professors*

Co-development and validation of a prototype of cognitive robotic architecture for human-aware interactive task learning with real industrial collaborative robots. Practical works teaching in python/AI for engineering students.

october 2018 **Research exchange internship : Human/Robot interaction**

*Collaborative Robotic Laboratory (CoRLuc), Coimbra University, Supervisor: Pedro Neto, assistant professor*

Classification of EMG signals for gesture recognition and robotic control of an IIWA robot (python, java)

2018 (5 months) **R&D internship : Visual-Inertial navigation**

*LVIC/CEA-LIST, Nano-Innov, Paris-Saclay, Supervisors: Richard Guillemard and Bruno Petit, research engineers*

Zero velocity update for visual-inertial SLAM by developing a multimodal stationary detector (camera, IMU). (C++11 programming)

2018 (6 months) **Student project : Drone navigation by optical flow and self-organising maps**

*CentraleSupélec, Supervisors : Hervé Frezza-Buet, professor | Jeremy Fix, assistant professor. In collaboration with Nino Vieillard and Nathan Darpentigny*

Unsupervised classification of the optical flow of a drone navigating in a simulated cave under Unity/ROS.

2016-2017 **Student project: Autonomous robot navigation**

*Centralesupélec, Supervisors: Anthony Kolar, Caroline Lelandais-Perrault, teachers-researchers. In collaboration with Thomas Cusson and Xiaoya Guo.*

Real time images processing by exploiting the GPU of a raspberry pi 3 for autonomous robot navigation and obstacle avoidance (C++, python and OpenGLES).

## PRACTICAL SKILLS

| | |
|---|---|
| *Language* | English (professional) \| German (intermediate) \| French (mother tongue) |
| *Software* | Machine learning : Python (keras, tensorflow, numpy, scikit-learn)<br>Vision : OpenCV<br>Robotics : ROS, C++, simulation notions (Vrep, Unity, CAD modeling)<br>Documents : Latex/Beamer/TikZ, Microsoft Office<br>Development: Linux, Emacs, Git, Docker |
| *Soft skills* | Student project management, research communications and vulgarisation |
| *Hobbies* | Choir singing, Classical guitar |

## PUBLICATIONS


[1] Francois Helenon, Stephane Thiery, Eric Nyiri, and Olivier Gibaru. "Cognitive Architecture for Intuitive and Interactive Task Learning in Industrial Collaborative Robotics". In: *2021 the 5th International Conference on Robotics, Control and Automation*. New York, NY, USA: Association for Computing Machinery, Mar. 5, 2021, pp. 119–124. ISBN: 978-1-4503-8748-4. URL: https://doi.org/10.1145/3471985.3472385.

[2] Francois Helenon, Laurent Bimont, Eric Nyiri, Stephane Thiery, and Olivier Gibaru. "Learning prohibited and authorised grasping locations from a few demonstrations". In: *29th IEEE International Conference on Robot and Human Interactive Communication, RO-MAN 2020*. 2020. ISBN: 9781728160757. DOI: 10.1109/RO-MAN47096.2020.9223486.

[3] Richard Guillemard, François Hélénon, Bruno Petit, Vincent Gay-Bellile, and Mathieu Carrier. "Stationary Detector for Monocular Visual-Inertial SLAM". In: *2019 International Conference on Indoor Positioning and Indoor Navigation (IPIN)*. 2019, pp. 1–8. DOI: 10.1109/IPIN.2019.8911750.


## TEACHING

2019-2021 **Practical works**

*Arts et Métiers Sciences and Technology, Lille*

Introduction to python programming

2019-2021 **Artificial intelligence for robotics (Practical works)**

*Arts et Métiers Sciences and Technology, Lille*

Supervision of mini projects in an introduction to artificial intelligence course

2019-2021 **3rd year student projects**

*Arts et Métiers Sciences and Technology, Lille*

Co-supervision of projects in computer science, robotics and artificial intelligence for various groups of second and final year students of the engineering curriculum (Master)

## COMPLEMENTARY DOCTORAL TRAINING

july 2021 (30h) **Deep Reinforcement Learning Summer School (DLRL)**

*CIFAR, Canada, Virtual*

Training and review of the state of the art in deep learning and reinforcement learning by world leading experts in AI

june 2021 (30h) **Rehabilitation and Assistive Technologies based on Soft Robotics (Softech Rehab)**

*CREO Lab, University of Rome Bio-Medical Campus of Rome, (Virtual)*

Introduction to soft robotics and its applications applications, especially in the field of assistance

.