

## Gabriel Gattaux Goulon

PhD Candidate in Bio-inspired Robotics  
Aix-Marseille University – CNRS



### CONTACT INFORMATION

Ph.D. Student  
Bio-Inspired System Team  
Institut des Sciences du Mouvement  
Aix-Marseille University, CNRS  
Marseille, 13008

*Email:* gabriel.gattaux@univ-amu.fr  
*Linkedin:* gabriel-gattaux  
*Github:* Gaby-253  
*Scholar:* Gabriel Gattaux

### RESEARCH INTEREST

*Understanding by building.* My research seeks to uncover the neuronal and dynamical principles underlying adaptive behavior in biological and robotic systems. I investigate how perception, neural computation, body dynamics, and sensorimotor coordination interact to generate robust behavior, from locomotion and navigation to spatial cognition and embodied decision-making. By combining computational neuroscience, neuromorphic, control, and robotics, I develop biologically grounded models of intelligence and validate them on embodied robotic platforms.

### EDUCATION

**Aix-Marseille University**, CNRS, Marseille, France

**2022–2026** Ph.D. in Biorobotics  
Advisors: Franck Ruffier, Julien Serres and Antoine Wystrach  
Research focus: Insect-Inspired Neurorobotics  
Thesis title: *Insect Neuroethology For and Through Robotic Navigation*

**ENSIL-ENSCI**, University of Limoges, France

**2019–2022** Engineering Degree (MSc) in Mechatronics  
Final project: *Coordinated Control of a TurtleBot Swarm with UWB sensors*

**Wrocław University of Science and Technology**, Wrocław, Poland

**2021** Erasmus Exchange Program in Computer Science

**IUT Nancy-Brabois**, University of Lorraine, Nancy, France

**2017–2019** University Diploma (DUT) in Mechanical Engineering  
Double curriculum: Polytech Nancy (integrated preparatory program)

### PUBLICATIONS

Journal Publications **Gattaux, G.**, Wystrach, A., Serres, J. R., and Ruffier, F. (2025), Route-centric ant-inspired memories enable panoramic route-following in a car-like robot, *Nature Communications*, (**IF 15.7**), doi:10.1038/s41467-025-62327-3.

**Gattaux, G.**, Diallo, H., Serres, J. R., Wystrach, A., and Ruffier, F. (2026), AntFlie: Frugal Visual Teach and Repeat on Narrow FoV Micro-Drones, *IEEE Robotics and Automation Letters*, (**IF 5.3**), doi:10.1109/LRA.2026.3667486.

Conference  
Proceedings

**Gattaux, G.**, Wystrach, A., Ruffier, F., and Serres, J. (2025), Enhancing Ant-Inspired Visual Compass with Focused Visual Scan in a Compact Robot, *IEEE 7th International Conference on Artificial Intelligence Circuits and Systems (AICAS)*, doi:10.1109/AICAS64808.2025.11173128.

**Gattaux, G.**, Serres, J. R., Ruffier, F., and Wystrach, A. (2025), Visual Homing in Outdoor Robots Using Mushroom Body Circuits and Learning Walks, *Biomimetic and Biohybrid Systems: 14th International Conference, Living Machines 2025 Proceedings*, doi:10.1007/978-3-032-07448-5\_38.

**Gattaux, G.**, Vimbert, R., Wystrach, A., Serres, J.R., Ruffier, F. (2023), Antcar: Simple Route Following Task with Ants-Inspired Vision and Neural Model. hal-04060451 (Preprint).

PATENTS

**Gattaux, G.**, Serres, J., Wystrach, A., Ruffier, F., (2023 FR, 2024 WO), Method of guiding to a destination, *FR No. FR3151085A1, WO No. WO202501224A1*.

**Gattaux, G.**, Serres, J., Wystrach, A., Ruffier, F., (2026), Visual Estimation of Relative and Absolute Heading, *submitted to SATT-SE, under review*.

AWARDS &  
FUNDING

2025	Biomim'Expo Best Prize Award.
2025	Travel Grant, Grounding Cognition in Mechanistic Insight.
2024–2025	CNRS IEA Travel Grant.
2022–2025	Doctoral Fellowship (AMU / AID).
2024	Doctoral School Poster Award.

RESEARCH  
COLLABORATIONS  
National

2022–present	Insect-inspired robotic navigation, spatial cognition, and computational models of insect behavior. Collaboration between Aix-Marseille University, CNRS, Research Center on Animal Cognition, ENSTA Bretagne, and DGA-AID.
2024–present	Development of swarm coordination methods based on visual sensing and insect-inspired navigation principles. Collaboration with GIPSA-Lab, INSA Strasbourg, and ENSTA Bretagne.

International

2024–present	Humanoid robot navigation and visual cognition on the HRP-5P platform through the CNRS-AIST Joint Robotics Laboratory (Tsukuba, Japan).
2024	Neuromorphic perception and navigation using event-based vision and spiking neural networks in collaboration with researchers from the University of Sussex.

## PRESENTATIONS

Conference Presentations	2026	IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), Pittsburgh, USA (Oral Presentation).	
	2026	Embodied Intelligence Conference (Oral Presentation).	
	2026	XIII European Congress of Entomology (ECE2026), France (Poster Presentation).	
	2025	Grounding Cognition in Mechanistic Insight Conference, Janelia Research Campus, USA (Poster Presentation).	
	2025	Living Machines 2025, Sheffield Hallam University, UK (Oral Presentation).	
	2025	IEEE AICAS, ENSEIRB-MATMECA, France (Oral Presentation).	
	2025	Biomim'Expo, Marseille, France (Oral Presentation).	
	2024	CapoCaccia Workshops toward Neuromorphic Intelligence, Sardinia, Italy (Oral Presentation and Robotic Demonstration).	
	2023	French National Robotics Research Days (JNRR), France (Oral Presentation).	
	2023	SCIoI & ISAB Summer School on Embodied Intelligence, TU Berlin, Germany (Poster Presentation).	
	Seminars and Workshops	2026	LAAS Robotics Team Seminar, University of Toulouse, France (Seminar Talk).
		2026	Submeeting Workshop, ENSTA Bretagne, France (Oral Presentation and Poster).
		2025	Workshop on Neuromorphic Perception and Computation in Autonomous Systems (NPCAS), Sheffield Hallam University, UK (Workshop Talk).
2025		Forum Innovation Defense, Paris, France (Invited Presentation).	
2024		CNRS-AIST Joint Robotics Laboratory Seminar, AIST, Japan (Seminar Talk).	
2024		Humanoid Demonstration for CNRS Informatique, AIST, Japan (Demonstration).	
2024		GT8 School on Learning and Neuroscience for Robotics, Sorbonne University, France (Oral Presentation).	
2023–2024		Human Movement Science Doctoral School Day, Aix-Marseille University (Poster Presentation x2).	
MEDIA COVERAGE	2025	Gattaux et al. ( <i>Nature Communications</i> , 2025) received national and international media coverage, including <i>Le Monde</i> , <i>Les Echos</i> , <i>France Culture</i> , <i>France Inter</i> , <i>CNRS INS2I</i> , and <i>Navigation News</i> .	
	2025	Recipient of the Biomim'Expo Award, featured in national media outlets.	
MENTORING EXPERIENCE	2024–2025	Supervised 4 MSc and engineering students in bio-inspired robotics, neural modeling, and autonomous systems; contributions supported ongoing research projects, including results reported in Gattaux et al., RAL (2026).	

## TEACHING EXPERIENCE

155 hours of teaching and tutoring at BSc and MSc levels

**ENSTA Bretagne**, Institut Polytechnique de Paris, Brest, France

**2025** *Teaching Assistant*  
 Subjects: Designed and taught an introductory lecture and practical sessions on visual familiarity for robotic navigation (MSc level), spanning ethology, computational neuroscience, computer vision, and robotics.

**Aix-Marseille University**, Faculty of Science, Marseille, France

**2022–2024** *Teaching Assistant*  
 Subjects: Taught lectures and practical sessions in Logic, Project Management, Python Programming, Relational Databases (SQL), Excel, and C++ for BSc and MSc students.

**ENSIL-ENSCI**, University of Limoges, France

**2022–2024** *Invited Tutor*  
 Subjects: Taught tutorials in calculus, linear algebra, and applied mathematics for BSc engineering students.

PROFESSIONAL SERVICE	2026	Peer Reviewer, IEEE Transactions on Robotics.
	2025	Peer Reviewer, PLoS Computational Biology.
	2025–present	Member, IEEE Robotics and Automation Society (RAS) Technical Committee on BioRobotics.
	2024	Organizer, Human Movement Science Doctoral School Day.
	2023	Peer Reviewer, IROS.
	2023	Organizer and Session Chair, JCRR (Day for Early Career Researchers), French National Robotics Research Days (JNRR).
	2018	National Student Entrepreneur Status (SNEE), IUT Nancy-Brabois.

#### TECHNICAL SKILLS

Programming: Python, MATLAB, C++, C

Robotics: ROS, MC-RTC, humanoid robots, UAVs, UGVs

Control & Estimation: Control theory, state estimation, sensor fusion, SLAM

Computational Neuroscience: Dynamical systems, spiking neural networks, neuro-morphic models

Computer Vision: Visual navigation, visual place recognition, optic flow, event-based vision, object detection

Embedded Systems: STM32, FPGA, ARM platforms (Jetson, Raspberry Pi, NUC)

Simulation: MuJoCo, Gazebo

#### REFERENCES

Upon request