

**Fabien COLONNIER**  
SINGAPORE  
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30 years old  
Car driving license

**Research Scientist**  
*Temasek Lab. @ NUS*

## Employment History

- **Research scientist** Singapore  
*Neuromorphic group at Temasek Lab. @ NUS* 2017 - today
  - Started to work on Spiking Neural Network for robotic Navigation
  - Worked on algorithms for Visual Odometry and obstacle avoidance using event-based sensors
  - Involved in aerial and ground robot designs
- **PhD student** Marseille, FR  
*Biorobotics team at the Institute of Movement Sciences, Aix-Marseille University* 2012 - 2017
  - Designed bio-inspired visual algorithm for target tracking application and visual odometry
  - Implemented of a controller for mobile robot positioning
  - Involved in the RT-MaG project: a Matlab toolbox to program Real-Time application on Computer-on-Module running a Linux OS
  - Teachings: Introduction to engineering design and kinematic modelling  
Practical work on GRAFCET and assembler programming
- **Intern** Cologne, GER  
*Bertrandt GmbH, Powertrain dept.* 2012
  - Worked on the development of an engine management software for a 2-stroke Diesel engine prototype
  - Created and validated models for a cooling system with GT-Suite for Ford GmbH
- **Intern** Bièvres, FR  
*Bertrandt SA, Powertrain dept.* 2011
  - Analyzed data for a wearing study of piston rings and rod bearings using Thin Layer Activation test method (for Renault SA)
  - Worked on an engine cooling strategies using Flowmaster with a German team

## Education

- **PhD in bio-inspired robotics** Marseille, FR  
*Biorobotics team at the Institute of Movement Sciences, Aix-Marseille University* 2017  
Thesis title: *Hyperacute artificial compound eye: robotic applications to Stabilization and Pursuit*
- **MSc in Automotive engineering with a specialization in Embedded Systems** Laval, FR  
*ESTACA, a transport engineering school ([www.estaca.fr](http://www.estaca.fr))* 2012  
Projects:
  - Modelling of an electrical powertrain with a CVT in Matlab&Simulink with physical test validation

- Development of a supervising function for an electrical powertrain:  
Creation of a torque structure  
Design of a Battery Management System in collaboration with Saft batteries  
Test with rapid prototyping tools (Motohawk)

- **French Scientific baccalaureate**

Beaupréau, FR

*Lycée Notre Dame de Bonnes Nouvelles*

2007

- Option Engineering Sciences and specialized in Physics
- Graduated with honours

## Computer skills

- **Programming Languages**

- Expert: C, Matlab,  $\text{\LaTeX}$ , VBA (macro Excel)
- Intermediate: C++, C#

- **Embedded System**

- Linux programming: ROS, Git
- Embedded Linux (Yocto Project, bitbake, Preempt-RT, Xenomai)
- Computer-on-Module (Gumstix, Raspberry Pi)
- Microcontrollers programming (PIC Microchip, arduino)

- **Simulation Software:** Matlab & Simulink, GT-suite, Flowmaster

- **CAD Software:** Solidworks, Catia V5

- **Others:** Microsoft Office Suite, Adobe Premier, Inkscape

## Languages

- **French:** Mother tongue
- **English:** Fluent (TOEIC 920/990 in 2010)
- **German:** Basic

## Interests & Activities

- **Sport:** Running (Half-marathon and trail running), swimming and rock climbing
- **Others:** Interested in mechanics (car maintenance, motorbike reconditioning) and DIY

## Publications

### • Journals

- F. Colonnier**, S. Ramírez-Martinez, S. Viollet and F. Ruffier, (2019), “A bio-inspired sighted robot chases like a hoverfly”, *Bioinspiration & Biomimetics*
- T. Raharijaona, R. Mawonou, T.V. Nguyen, **F. Colonnier**, M. Boyron, J. Dipeolu and S. Viollet, (2017), “Local Positioning System Using Flickering Infrared LEDs”, *MDPI Sensors*
- F. Colonnier**, A. Manecy, R. Juston, H. Mallot, R. Leitel, D. Floreano and S. Viollet, (2015). “A small-scale hyperacute compound eye featuring active eye tremor: application to visual stabilization, target tracking, and short-range odometry”, *Bioinspiration & Biomimetics*
- S. Viollet, S. Godiot, R. Leitel, W. Buss, P. Breugnot, M. Menouni, R. Juston, F. Expert, **F. Colonnier**, G. L'Eplattenier, A. Brückner, F. Kraze, H. Mallot, N. Franceschini, R. Pericet-Camara, F. Ruffier, and D. Floreano, (2014). “Hardware Architecture and Cutting-Edge Assembly Process of a Tiny Curved Compound Eye”, *MDPI Sensors*
- F.L. Roubieu, J.R. Serres, **F. Colonnier**, N. Franceschini, S. Viollet and F. Ruffier, (2014). “A biomimetic vision-based hovercraft accounts for bees' complex behaviour in various corridors”, *Bioinspiration & Biomimetics*

### • Patents

- S. Viollet, **F. Colonnier** and E. Vanhoutte, “Système de mesure de la distance d'un obstacle par flux optique”, *European patent* (published n° WO2017FR52739)

### • Conferences

- F. Colonnier**, S. Viollet and F. Ruffier, “ACEbot: robotic behaviors provide new insights on insect visual pursuit, motion camouflage and interception”, International Conference on Invertebrate Vision *ICIV*, Bäckaskog Castle, Sweden, August 6-11, 2019
- F. Colonnier**, L. Della Vedova, Rodney Swee Huat Teo and Garrick Orchard, “Visual Odometry and Low Optic Flow Measurement by Means of a Vibrating Artificial Compound Eye”, Australasian conference on Robotics and Automation (*ACRA*), Lincoln, New Zealand, December 4-6, 2018
- F. Colonnier**, A. Manecy, R. Juston and S. Viollet, “Visual Odometry and Low Optic Flow Measurement by Means of a Vibrating Artificial Compound Eye”, pages 153-163. Biomimetic and Biohybrid Systems: 4th International Conference, Living Machines 2015, Barcelona, Spain, July 28 - 31, 2015, Proceedings *Springer International Publishing*
- Valentino Braitenberg award - Best talk prize

### • Workshop presentations

- A. Manecy, E. Vanhoutte, S. Mafrica, **F. Colonnier**, F. Ruffier, N. Marchand and S. Viollet, “X4-MaG and RT-MaG: a low-cost open-source micro-quadrotor based on Real-Time Linux and a new Matlab/Simulink toolbox”, *IROS Aerial Open Source Robotics Workshop*, 2015
- F. Colonnier**, A. Manecy, R. Juston and S. Viollet, “Hyperacuity: Application to visual stabilization”, *IROS Vision-Based Control and Navigation of Small, Light-Weight UAVs Workshop*, 2015

### • Other Oral Presentations

- F. Colonnier** and S. Viollet, “Mecanum Wheel Robot : Presentation and application”, TechDays 2016, 4ème journées technologiques Robotex, IRCCyN, Nantes (France), September 2016.
- F. Colonnier**, “Demonstration of CurvACE (Curved Artificial Compound Eye)”, 2nd Workshop on Multi Unmanned Vehicles Systems, Compiègne (France), July 2014

**F. Colonnier**, “Demonstration of CurvACE (Curved Artificial Compound Eye)”, 2nd Workshop on Research, Education and Development of UAS, Compiègne (France), November 2013

A. Manecy and **F. Colonnier**, “Présentation de la plateforme ROBOTEX : Arène de vol”, TechDays 2013, 1ère journées technologiques Robotex, LAAS, Toulouse (France), July 2013

A. Manecy, G. Sanahuja, J. Dumon, F. Elisei and **F. Colonnier**, “Session thématique : Systèmes de capture du mouvement”, TechDays 2013, 1ère journées technologiques Robotex, LAAS, Toulouse (France), July 2013