Fabien COLONNIER
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SINGAPORE
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29 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 positionning
  - 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) — *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, 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 (Semi-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.Diperi and S. Viollet, (2017), “Local Positioning System Using Flickering Infrared LEDs”, *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. Breugnon, 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”, *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^o WO2017FR52739)

- **Conferences**

  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