

List of publications – Julien Dupeyroux, PhD (v.09-2021)

Journal papers

- [10] De Croon, G., De Wagter, C., **Dupeyroux, J.**, Chatterjee, A., and Ruffier, F. (in preparation). *Optic flow and rotation derivatives suffice for attitude estimation*.
- [9] De Croon, G., **Dupeyroux, J.**, Fuller, S., and Marshall, J. (under review). *Insect-inspired AI for autonomous robots*.
- [8] Manoonpong, P., Patanè, L., Xiong, X., Brodoline, I., **Dupeyroux, J.**, Viollet, S., Arena, P., and Serres, J. (under review). *Insect-inspired robots: bridging biological and artificial systems*.
- [7] **Dupeyroux, J.**, Dinaux, R., Wessendorp, N., and de Croon, G. (under review). *The Obstacle Detection and Avoidance Dataset for Drones*.
- [6] Dinaux, R., Wessendorp, N., **Dupeyroux, J.**, and de Croon, G. (2021). *FAITH: Fast iterative half-plane focus of expansion estimation using event-based optic flow*. IEEE Robotics and Autonomous Letters, vol. 6, no. 4, p. 7627-7634.
DOI: <https://www.doi.org/10.1109/LRA.2021.3100153>.
IF: 3.741 (JCR rank 9/28 in Robotics).
- [5] Viollet, S., **Dupeyroux, J.**, and Serres, J. (2020). *Conception et réalisation d'un robot bio-inspiré : le robot fourmi AntBot*. Techniques & Culture, vol. 73, p. 128-141.
URL: <https://journals.openedition.org/tc/13557>
- [4] **Dupeyroux, J.**, Viollet, S., and Serres, J. (2020) *AntBot : un robot qui s'oriente comme une fourmi - Applications à la navigation à vue sans GPS ni magnétomètre*. Techniques de l'Ingénieur (Réf : IN236).
URL: <https://www.techniques-ingenieur.fr/base-documentaire/innovation-th10/conception-durable-inspiree-du-vivant-le-biomimetisme-42616210/antbot-un-robot-qui-s-oriente-comme-une-fourmi-in236/>
- [3] **Dupeyroux, J.**, Serres, J., and Viollet, S. (2019). *Antbot: a six-legged walking robot able to home like desert ants in outdoor environments*. Science Robotics, vol. 4 (eaau0307).
DOI: <https://www.doi.org/10.1126/scirobotics.aau0307>.
IF: 23.748 (JCR rank 1/28 in Robotics).
- [2] **Dupeyroux, J.**, Viollet, S., and Serres, J. (2019). *Polarized skylight-based heading measurements: a bio-inspired approach*. Journal of the Royal Society Interface, vol. 16, no. 150 (20180878).
DOI: <https://www.doi.org/10.1098/rsif.2018.0878>.
IF: 3.224 (JCR rank 16/69 in Multidisciplinary Sciences).
- [1] **Dupeyroux, J.**, Viollet, S., and Serres, J. (2019). *An ant-inspired celestial compass applied to autonomous outdoor robot navigation*. Robotics and Autonomous Systems, vol. 117 (40-56).
DOI: <https://www.doi.org/10.1016/j.robot.2019.04.007>
IF: 3.120 (JCR rank 12/28 in Robotics, and 59/140 in Computer Science & Artificial Intelligence).

International conferences

- [14] Stroobants, S., **Dupeyroux, J.**, and de Croon, G. (under review). *Design and implementation of a parsimonious neuromorphic PID for onboard altitude control for MAVs using neuromorphic processors*.
- [13] Olejnik, D., Wang, S., **Dupeyroux, J.**, Stroobants, S., Karasek, M., de Wagter, C., and de Croon, G. (under review). *An experimental study of wind resistance and power consumption in MAVs with a low-speed multi-fan wind system*.
- [12] Gonzalez-Alvarez, M., **Dupeyroux, J.**, Corradi, F., and de Croon, G. (under review). *Evolved neuromorphic radar-based altitude controller for an autonomous open-source blimp*.

- [11] Wessendorp, N., Dinaux, R., **Dupeyroux, J.**, and de Croon, G. (accepted for publication in IEEE/RSJ IROS 2021). *Obstacle Avoidance onboard MAVs using a FMCW radar*.
arXiv: <https://arxiv.org/abs/2103.02050>.
- [10] **Dupeyroux, J.**, Hagenaars, J., Paredes-Vallés, F., and De Croon, G. (2021). *Neuromorphic control for optic-flow-based landings of MAVs using the Loihi processor*. 2021 **IEEE** International Conference on Robotics and Automation (ICRA), 96-102, Xi'an, China.
DOI: <https://doi.org/10.1109/ICRA48506.2021.9560937>.
- [9] **Dupeyroux, J.**, Viollet, S., and Serres, J. (2020). *Insect-inspired omnidirectional vision for autonomous localization on-board a hexapod robot*. 28th **IEEE** Mediterranean Conference on Control and Automation, 893-898, Saint Raphaël, France.
DOI: <http://www.doi.org/10.1109/MED48518.2020.9183091>.
- [8] **Dupeyroux, J.**, Viollet, S., and Serres, J. (2020). *Bio-inspired celestial compass yields new opportunities for urban localization*. 28th **IEEE** Mediterranean Conference on Control and Automation, 881-886, Saint Raphaël, France.
DOI: <http://www.doi.org/10.1109/MED48518.2020.9183367>.
- [7] **Dupeyroux, J.**, Serres, J., and Viollet, S. (2019). *AntBot: a fully insect-inspired hexapod homing like desert ants*. 4th International Conference on Invertebrate Vision (ICIV 2019), Bäckaskog Castle, Sweden.
URL: <https://hal-amu.archives-ouvertes.fr/hal-02272156v1>.
- [6] **Dupeyroux, J.**, Serres, J., and Viollet, S. (2018). *A hexapod walking robot mimicking navigation strategies of desert ants Cataglyphis*. Conf. on Biomimetic and Biohybrid Systems, 145-156, Paris, France. Springer, Cham.
DOI: https://www.doi.org/10.1007/978-3-319-95972-6_16.
- [5] **Dupeyroux, J.**, Boutin, V., Serres, J. R., Perrinet, L. U., and Viollet, S. (2018). *M2APix: A bio-inspired auto-adaptive visual sensor for robust ground height estimation*. 2018 **IEEE** International Symposium on Circuits and Systems (ISCAS), 1-4, Florence, Italie.
DOI: <https://www.doi.org/10.1109/ISCAS.2018.8351433>.
- [4] **Dupeyroux, J.**, Dipieri, J., Boyron, M., Viollet, S., and Serres, J. (2017). *A novel insect-inspired optical compass sensor for a hexapod walking robot*. 2017 **IEEE/RSJ** International Conference on Intelligent Robots and Systems (IROS), 3439-3445, Vancouver, Canada.
DOI: <https://www.doi.org/10.1109/IROS.2017.8206183>.
- [3] **Dupeyroux, J.**, Dipieri, J., Boyron, M., Viollet, S., and Serres, J. (2017). *A bio-inspired celestial compass applied to an ant-inspired robot for autonomous navigation*. 2017 **IEEE** European Conference on Mobile Robots (ECMR), 1-6, Paris, France.
DOI: <https://www.doi.org/10.1109/ECMR.2017.8098680>.
- [2] **Dupeyroux, J.**, Passault, G., Ruffier, F., Viollet, S., and Serres, J. (2017). *Hexabot: a small 3D-printed six-legged walking robot designed for desert ant-like navigation tasks*. IFAC World Congress 2017 (1628-1631), Toulouse, France.
URL: <https://hal-amu.archives-ouvertes.fr/hal-01643176/>.
- [1] **Dupeyroux, J.**, Viollet, S., and Serres, J. (2017). *Providing an autonomous hexapod walking robot with the ability to reorientate : application of a novel ant-inspired celestial compass*. Journées Jeunes Chercheurs en Robotique 2017, Bayonne, France.
URL: https://jjcr2017.sciencesconf.org/data/pages/JJCR17_DUPEYROUX_Julien.pdf.

Patents

- [1] **Dupeyroux, J.**, Monnoyer, J., Serres, J., and Viollet, S. *Dispositif de détection du cap d'un véhicule par détection de photons polarisés linéairement*. Patent published under no. FR3086088A1.
URL: https://worldwide.espacenet.com/publicationDetails/biblio?CC=FR&NR=3086088A1&KC=A1&FT=D&ND=1&date=20200320&DB=&locale=en_EP#.

Science popularization

- [3] **Dupeyroux, J.**, Viollet, S., and Serres, J. (2019). *AntBot is able to go home like desert ants*. The Science Breaker.
DOI: <https://doi.org/10.25250/thescbr.brk252>.
- [2] **Dupeyroux, J.** (2019). *Ce petit robot qui navigue sans GPS comme une fourmi*. The Conversation.
URL: <https://theconversation.com/ce-petit-robot-qui-navigue-sans-gps-comme-une-fourmi-116700>.
- [1] **Dupeyroux, J.**, Viollet, S., and Serres, J. (2019). *AntBot : un robot fourmi autonome qui navigue sans GPS*. La Lettre de Grand Luminy Technopôle, no. 100, p. 12.
URL: https://www.grandluminy.com/sites/default/files/lettre-100mai-19_grandluminy.pdf.

Awards and honours

- [2020] Winner of the 7th International Bionic Award.
- [2020] Winner of the PhD Prize of Aix-Marseille University.
- [2020] 2nd Best PhD Prize of the French Research Robotics Network (CNRS).
- [2019] Winner of the IoT Industry and Services Prize, organized by Embedded France.
- [2018] Winner of the Best Paper Award at the 2018 Conference on Biomimetic and Biohybrid Systems.
- [2017] Winner of the Best Paper Award at the 2017 European Conference on Mobile Robotics (ECMR).
- [2014] Winner of a merit scholarship from the University of Cergy-Pontoise (UCP), France.

Press coverage (selected)

Science - *This ant-inspired robot can navigate better than civilian GPS.*

Nature Electronics - *AntBot makes its own way home.*

Wired - *A 6-legged robot stares at the sky to navigate like a desert ant.*

Digital Trends - *Ant-inspired walking robot navigates without GPS by using polarized light.*

New Scientist - *Robot mimics desert ants to find its way home without GPS.*

de Volkskrant - *Robot weet de weg zonder gps dankzij woestijnmier.*

Le Monde - *AntBot, un robot autonome inspiré par des fourmis du désert.*

Challenges, Reuters - *Un robot à pattes qui a le sens de l'orientation.*

Les Echos - *Un capteur peu coûteux pour naviguer sans GPS.*

France Inter - *C'est une innovation marquante: ce robot-fourmi s'oriente sans GPS.*

CNRS - *Le premier robot à pattes qui se déplace sans GPS.*

Cité des Sciences et de l'Industrie - *Robot à pattes sans GPS.*

La Provence - *Marseille : le robot inspiré de la fourmi du désert.*

La Marseillaise - *Un robot qui se déplace sans GPS conçu à Marseille.*

Futura Science - *Voici Antbot, un robot inspiré des fourmis et qui se déplace sans GPS.*

Science et Avenir - *Ce robot se déplace en se repérant comme les fourmis du désert.*

Science et Vie - *Ce robot réussit à s'orienter grâce à la lumière du soleil.*

Trust My Science - *AntBot: le tout premier robot évoluant sans GPS pour se repérer.*



Noteworthy events

AntBot has been presented at the **VivaTechnology** exhibition in Paris from May 16 to 18, 2019, at EDF's invitation (French electric utility company). Demos were performed during these three days on the Robot Park, including interviews with the French Minister of the Armed Forces Florence Parly, French Minister of the Economy and Finance Bruno Le Maire, and the French Secretary of State for the Digital Economy Cédric O.

