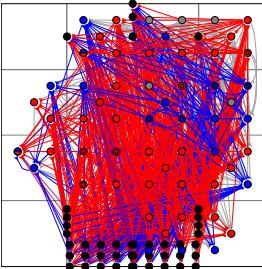
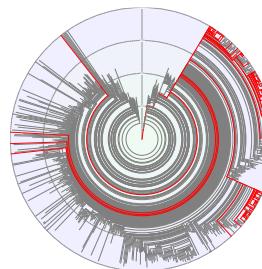


# Dr. Kevin Godin-Dubois

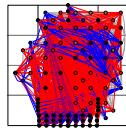
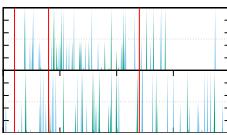
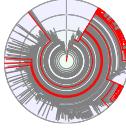
Contact	<p>✉ k.j.m.godin-dubois@vu.nl 🏡 Vrije Universiteit Amsterdam de Boelelaan 1081a, 1081HV Amsterdam, The Netherlands</p>	<p>🌐 kgd-al.github.io 📬 kgd-al@github.com 🐦 godinduboisalife oogle Scholar</p>
Position	Researcher in Evolutionary Robotics (since November 2022)	

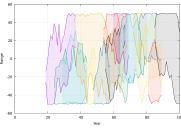
## Highlights

Research	<i>Artificial Life: Cognition, Interaction &amp; Language</i>	
Main fields		 Species Dynamics
	Artificial Neural Networks	Morphogenetic Engineering
Output	<p>3 journal articles (<i>Artificial Life</i>, <i>Frontiers</i>, <i>JOSS</i>) 5 international conference articles (<i>ALife</i>, <i>IEEE ALife</i>, <i>EvoAPP</i>) 6 international workshops short papers (<i>ALife</i>, <i>ECAL</i>, <i>AAAI</i>) Scientific software: ABrain, AMaze, Revolve2, SHARPIE</p>	
<b>Positions</b>		
Postdoctoral 2022 - Present	<p>Computer Science / Evolutionary Robotics <i>“NeuroEvolution and Reinforcement Learning for Embodied Robots”</i> Computational Intelligence Group - Vrije Universiteit Amsterdam, The Netherlands Supervisor: Dr. A. Yaman (a.yaman@vu.nl) Collaborators: Dr. A. Kononova (a.kononova@liacs.leidenuniv.nl)</p>	
Postdoctoral 2020 - 2022	<p>Computer Science / Artificial Intelligence <i>“Emergent cognitive architectures in virtual embodied robots”</i> REVA Team, IRIT - Toulouse I University, France Supervisors: Pr. Y. Duthen (yves.duthen@irit.fr) Pr. S. Cussat-Blanc (sylvain.cussat-blanc@irit.fr)</p>	
PhD 2016-2020	<p>Computer Science / Artificial Life <i>“Environment-driven speciation: long term interactions in artificial plant communities”</i> REVA Team, IRIT - Toulouse I University, France Supervisors: Pr. Y. Duthen (yves.duthen@irit.fr) Pr. S. Cussat-Blanc (sylvain.cussat-blanc@irit.fr)</p>	

<b>Teaching</b>	9 years (600+ hours)
Computer Science	Learning Machines, Bachelor and Master research projects Programming languages: Python, C, R Algorithms, Data Structures, Information theory Programming projects
Generalists	Data Science tools and languages Database modeling, SQL
<b>Skills</b>	
Programming	Fluent: C++, Bash, Python, L <sup>A</sup> T <sub>E</sub> X Working Knowledge: C, Java, R, VB, VBA, JavaScript
Technical	Evolutionary Algorithms, Machine Learning, Multi-Agents Systems, High-Performance Computing
Languages	French (Mother tongue), English

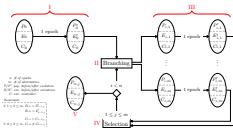
## Research

<b>Synopsis</b>	My main interests revolve around autonomous artificial life forms: from the design of efficient morphologies to the emergence of high-level control schemes and the evolutionary constraints that favor both. Recently I am mostly focused on Artificial Neural Networks (ANN) through NeuroEvolution and Reinforcement Learning, notably in the context of Interactive Evolutionary Robotics.
<b>Artificial Neural Networks</b>	<p>Studying the emergence of various “cognitive” capabilities in virtual robots, controlled by a spontaneously differentiated neural network, in response to biologically plausible stimuli.</p>  <p>[5, 3, 4] VIRTUAL fMRI Extracting stimulus-specific regions of an ANN by applying a virtual equivalent to functional Magnetic Resonance Imaging (fMRI) and building high-level cognitive maps. <b>Software:</b> ES-HyperNEAT (Custom implementation)</p>  <p>[13, 12] COMMUNICATION Exploring the mechanisms leading to emergent communication, how it becomes structured and its neural implementation.</p>
<b>Species Dynamics</b>	<p>Promoting complex evolutionary trajectories and extracting species-level information from individual reproductions.</p>  <p>[16, 14] PHYLOGENETICS Automatically transforming genealogic trees into phylogenetic abstraction to access the emergent species-level dynamics. <b>Software:</b> APOGeT(Automated Phylogeny Over Geological Timescales)</p>



#### [8] SPECIATION

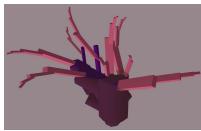
Application of a bio-inspired reproduction operator (Bail-Out Crossover) capable of spontaneously generating species barriers thereby allowing for emergent speciation.



#### [6, 21] EVOLUTIONARY ALGORITHMS

Introduced a novel paradigm, EDEnS (Environment-Driven Evolutionary Selection), relying on the indirect controlling of whole populations' evolutionary trajectories through an evolvable environmental controller.

### Morphogenetic Engineering



### Expertise

#### Evolutionary Algorithms

- Environment-Driven Evolutionary Selection (EDEnS)
- Multi-objective Optimisation
- High Performance Computing (HPC), Co-evolution, Novelty

#### Machine Learning

- Artificial Neural Networks (ANN, CNN, RNN)
- Composite Pattern-Producing Networks (CPPN)
- Cartesian Genetic Programming (CGP)
- Genetic Regulatory Networks (GRN)
- Hidden Markov Models (HMM)
- Stable baselines 3

### Teachings

<b>Postdoc</b> 2023-2024	Vrije Universiteit Amsterdam <ul style="list-style-type: none"> <li>• NeuroEvolution (lecture)</li> <li>• Learning Machines (projects)</li> <li>• Master and Bachelor thesis supervision</li> </ul>	<i>45h</i> <i>&gt;100h</i>
<b>Course management</b> 2021-2022	Toulouse I University & Toulouse III University, France <ul style="list-style-type: none"> <li>• Computer Science projects</li> <li>• English lectures</li> <li>• Information theory</li> <li>• Servers and contents</li> </ul>	<i>72h</i>  <i>67.5h</i>  <i>22.5h</i>  <i>18.75h</i>

<b>Teaching fellow</b>	Toulouse I University & Toulouse III University, France	
2017-2021	<ul style="list-style-type: none"> <li>• Statistical software (R &amp; Python)</li> <li>• Algorithms</li> <li>• Excel &amp; VBA</li> <li>• Modeling in databases</li> </ul>	36h
		60h
		60h
		21h
<b>Practical work supervisor</b>	Toulouse III University, France	
2016-2021	<ul style="list-style-type: none"> <li>• Software projects</li> <li>• Data structures</li> <li>• C Programming</li> <li>• Python</li> </ul>	69.2h
		18.8h
		36h
		8h

## Outreach

<b>Reviewer</b>	<ul style="list-style-type: none"> <li>• Symposium on Artificial Life program comitee member</li> <li>• Journal of Open Source Software reviewer</li> </ul>
<b>EduMix Aspi-Friendly</b>	Initiated a project for the self-monitoring of well-being in students with autistic disorders alongside a heterogeneous team of neuro-(a)typical and various profiles (faculty, designers, developers ...).

## Internships

<b>Morphogenetic Engineering</b>	Toulouse Research Institute on Computer Science (IRIT), France “Rule-based artificial embryogenesis in a complex 3D environment”
2016 (6 months)	Deployed rule-based genomes on the MecaCell platform to study artificial plant growth and cell specialization. <b>Contact:</b> Pr. Y. Duthen ( <a href="mailto:yves.duthen@irit.fr">yves.duthen@irit.fr</a> )
<b>Machine Learning</b>	IRIT, “Comparison of different evolutionary approaches, an application to the GECCO 2015 challenge”
2015 (3 months)	Performed a performance comparison (accuracy, efficiency) between Artificial Neural and Genetic Regulatory Networks on the 2015 GECCO temperature prediction challenge data. <b>Contact:</b> Pr. H. Luga ( <a href="mailto:herve.luga@irit.fr">herve.luga@irit.fr</a> )
<b>Machine Learning</b>	IRIT, “An architecture for automated bird discrimination”
2014 (2 months)	Applied Hidden Markov Models to the BirdClef2014 challenge on the identification of specific bird species in a corpus of thousands of recordings. <b>Contact:</b> Pr. J. Farinas ( <a href="mailto:jerome.farinas@irit.fr">jerome.farinas@irit.fr</a> )

## Education

<b>PhD</b> 2016 - 2020	Toulouse I University, France Defended the 15th of July 2020 Thesis title: " <i>Environment-driven speciation: long term interactions in artificial plant communities</i> " Investigated how complexification of artificial creatures could be further enhanced through the indirect control provided by a co-evolved, highly dynamical environment. <b>Rapporteurs:</b> Pr. P. Collet & DoR. F. Vico <b>Contact:</b> Pr. Y. Duthen ( <a href="mailto:yves.duthen@irit.fr">yves.duthen@irit.fr</a> )
<b>Master</b> 2014 - 2016	Toulouse III University, France ( <i>with honours</i> ) Artificial Intelligence: mathematical & symbolic models, training methods
<b>Bachelor</b> 2011 - 2014	Toulouse III University ( <i>with distinction</i> ) Computer Science: networks, programming, systems, mathematics

## Scholarships and Fellowships

<b>2023-2026</b> ~ 200K €	Postdoctoral funding from the Hybrid Intelligence consortium (Netherlands)
<b>2016-2019</b> 70K €	PhD Fellowship from the French Minister of Higher Education and Research (MESR)
<b>2015</b> 10K €	Master Scholarship from the International Mathematics and Computer Science Center (LabEx CIMI, Toulouse)
<b>2014-2015</b> 3K6 €	Merit Scholarship from the Regional Student Welfare Office (CROUS, Toulouse)

## Research Output

### **Journals (peer-reviewed)**

- [1] **K. Godin-Dubois**, K. Miras, and Anna V Kononova. "AMaze: An Intuitive Benchmark Generator for Fast Prototyping of Generalizable Agents". In: *Frontiers in Artificial Intelligence* Volume 8 - 2025 (2025). ISSN: 2624-8212. DOI: [10.3389/frai.2025.1511712](https://doi.org/10.3389/frai.2025.1511712).
- [2] **K. Godin-Dubois**, K. Miras, and A. V. Kononova. "AMaze: A Benchmark Generator for Sighted Maze-Navigating Agents". In: *Journal of Open Source Software* (2025).
- [3] **K. Godin-Dubois**, S. Cussat-Blanc, and Y. Duthen. "Explaining the Neuroevolution of Fighting Creatures Through Virtual fMRI". In: *Artificial Life* 29.1 (2023), pp. 66–93. ISSN: 1064-5462. DOI: [10.1162/artl\\_a\\_00389](https://doi.org/10.1162/artl_a_00389).

## International conferences (peer-reviewed)

- [4] **K. Godin-Dubois**, S. Cussat-Blanc, and Y. Duthen. “Specialization or Generalization: Investigating NeuroEvolutionary Choices via Virtual fMRI”. In: *ALIFE 2024: Proceedings of the 2024 Artificial Life Conference*. MIT Press, July 22, 2024. DOI: 10.1162/isal\_a\_00817.
- [5] **K. Godin-Dubois**, S. Cussat-Blanc, and Y. Duthen. “Spontaneous Modular NeuroEvolution Arising from a Life/Dinner Paradox”. In: *The 2021 Conference on Artificial Life*. Cambridge, MA: MIT Press, 2021, p. 95. DOI: 10.1162/isal\_a\_00431. Presentation: <https://vimeo.com/godinduboisalife/alife2021main>.
- [6] **K. Godin-Dubois**, S. Cussat-Blanc, and Y. Duthen. “Beneficial Catastrophes: Leveraging Abiotic Constraints through Environment-Driven Evolutionary Selection”. In: *2020 IEEE Symposium Series on Computational Intelligence (SSCI)*. 2020, pp. 94–101. DOI: 10.1109/SSCI47803.2020.9308411.
- [7] **K. Godin-Dubois**, S. Cussat-Blanc, and Y. Duthen. “Self-Sustainability Challenges of Plants Colonization Strategies in Virtual 3D Environments”. In: *Applications of Evolutionary Computation*. Ed. by P. Kaufmann and P. A. Castillo. Cham: Springer International Publishing, 2019, pp. 377–392. ISBN: 978-3-030-16692-2. DOI: 10.1007/978-3-030-16692-2\_25.
- [8] **K. Godin-Dubois**, S. Cussat-Blanc, and Y. Duthen. “Speciation under Changing Environments”. In: *ALIFE 19*. Vol. 31. Cambridge, MA: MIT Press, 2019, pp. 349–356. ISBN: 978-0-262-35844-6. DOI: 10.1162/isal\_a\_00186. Presentation: <https://vimeo.com/godinduboisalife/alife2019>.

## Workshops

- [9] H. Aydin, **K. Godin-Dubois**, L. G. Braz, F. Den Hengst, K. Baraka, M. M. Celikok, A. Sauter, S. Wang, and F. A. Oliehoek. “SHARPIE: A Modular Framework for Reinforcement Learning and Human-AI Interaction Experiments”. In: *Collaborative AI and Modeling of Humans*. arXiv, Feb. 2025. DOI: 10.48550/arXiv.2501.19245. (Visited on 03/14/2025).
- [10] H. Aydin, **K. Godin-Dubois**, L. Goncalvez Braz, Floris Den Hengst, K. Baraka, M. M. c Celikok, A. Sauter, S. Wang, and F. A. Oliehoek. “Towards an Experimentation Platform for Hybrid Human-AI Sequential Decision-Making”. In: *Frontiers in Artificial Intelligence and Applications*. Ed. by D. Pedreschi, M. Milano, I. Tiddi, S. Russell, C. Boldrini, L. Pappalardo, A. Passerini, and S. Wang. IOS Press, Sept. 2025. ISBN: 978-1-64368-611-0. DOI: 10.3233/FAIA250669.
- [11] **K. Godin-Dubois**, O. Weissl, K. Miras, and A. V. Kononova. “Interactive Embodied Evolution for Socially Adept Artificial General Creatures”. In: Evolution of Things Workshop at the ALife 2024 Conference. arXiv, July 31, 2024. DOI: 10.48550/arXiv.2407.21357.
- [12] **K. Godin-Dubois**, S. Cussat-Blanc, and Y. Duthen. “Emergent Communication for Coordination in Teams of Embodied Agents”. In: *4th International Workshop on Agent-Based Modelling of Human Behaviour (ALife2022)*. 2022.
- [13] **K. Godin-Dubois**, S. Cussat-Blanc, and Y. Duthen. “On the Benefits of Emergent Communication for Threat Appraisal”. In: *3rd International Workshop on Agent-Based Modelling of Human Behaviour*. Online, 2021. Presentation: <https://vimeo.com/godinduboisalife/abmhub2021>.

- [14] **K. Godin-Dubois**, S. Cussat-Blanc, and Y. Duthen. “APOGeT: Automated Phylogeny Over Geological Timescales”. In: *MethAL Workshop at ALife 2019*. 2019. DOI: 10.48550/arXiv.2407.21412.
- [15] **K. Dubois**, S. Cussat-Blanc, and Y. Duthen. “Towards an Artificial Polytrophic Ecosystem”. In: *Morphogenetic Engineering Workshop, at the European Conference on Artificial Life (ECAL) 2017 September 4*. 2017.

## Posters

- [16] **K. Godin-Dubois**, S. Cussat-Blanc, and Y. Duthen. “Studying Long Term Interactions between Plants and Their Environment”. In: *Alife 2018*. Tokyo, 2018. DOI: 10.13140/RG.2.2.27553.97125.

## Oral presentations

- [17] **K. Godin-Dubois**, S. Cussat-Blanc, and Y. Duthen. “Splinoids: First Steps out of EDEnS”. ERA Workshop at Alife 2020 (Montreal (Virtual)). 2020.

## Softwares and datasets

- [18] **K. Godin-Dubois**. *AMaze: Fully Discrete Training with Three Regimes (Direct, Scaffolding, Interactive) and Two Algorithms (A2C, PPO)*. Version 0.9. Zenodo, Feb. 6, 2024. DOI: 10.5281/ZENODO.10622913. (Visited on 09/19/2024).
- [19] **K. Godin-Dubois**, K. Miras, and A. V. Kononova. *AMaze: A Lightweight Benchmark Generator for Sighted Agents*. Zenodo, Apr. 2, 2024. doi: 10.5281/ZENODO.10907939.
- [20] A. Stuurman, O. Weissl, T.-C. Chiang, AndresG, D. Zeeuw, **K. Godin-Dubois**, and Roy. *Ci-Group/Revolve2: 1.2.3*. Zenodo. Software. Nov. 2024. doi: 10.5281/ZENODO.14143431. (Visited on 02/12/2025).

## Thesis

- [21] **K. Godin-Dubois**. “Environment-Driven Speciation: Long-Term Interactions in Artificial Plant Communities”. Doctoral school of Mathematics, Computer Science and Telecommunications (Toulouse, France), 2020. URL: <http://www.theses.fr/2020TOU10026/document>.