

Philippe Desjardins-Proulx

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CURRENT POSITION	Ph.D. candidate, Université de Sherbrooke, Canada, Canada Research Chair on Integrative ecology, Canada, Poisot Lab, Université de Montréal, Canada, Quebec Center for Biodiversity Science, Canada.
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CITIZENSHIP	Canada
LANGUAGES	FRENCH: Native language ENGLISH: Full professional proficiency JAPANESE: Elementary proficiency
EXPERTISE	<ul style="list-style-type: none">• Machine Learning: My thesis focuses on the problem of transfer learning, which could be described as the capacity to automatically transfer knowledge between a source (the knowledge we want to transfer) and a target (the model we want to build). I worked with many advanced approaches in machine learning, such as statistical relational learning (the union of logic with probability), and deep neural networks.• Bioinformatics: My main Ph.D. project involved deep learning in metagenomics (or ecogenomics). I also contributed to theoretical evolutionary ecology (speciation, community ecology) and worked with several biological data-sets.• Scientific computing: Almost all my undergraduate projects were done on scientific computing applied to biology and I worked four years (2009-2012) as a research professional, focusing on C/C++ simulations and GPU computing with CUDA/OpenCL on the Canada Research Chair on Terrestrial Ecosystems' scientific cluster.
EDUCATION	Department of Biology, Université de Sherbrooke, Canada. Ph.D., September 2012 – December 2016 [expected] <ul style="list-style-type: none">• Thesis Proposal: <i>Deep Transfer Learning and the Problem of Biodiversity</i>• Adviser: Dr. Dominique Gravel• Co-adviser: Dr. Timothée Poisot• Area of Study: Machine learning, molecular ecology, population genetics.• Comprehensive exam: Maximum Entropy in Ecology & Evolution.• Courses: Advanced Distributed Computing (A13), Business Intelligence (S15). College of Engineering, University of Illinois at Chicago, Chicago, USA. Graduate Certificate in Bioinformatics, 2012, <ul style="list-style-type: none">• Area of Study: Data Mining & Biostatistics. Université du Québec, Québec, Canada.

- B.S., 2009,
- Major in Biology,
 - Minor in Mathematics & Computer Science.

AWARDS

- Alexander Graham Bell Graduate Scholarship (2012)
- **From:** Natural Sciences and Engineering Research Council of Canada
 - **Description:** Most competitive Canadian scholarship in science.
 - **Value:** 105 000 CAD (equivalent to 105 000 USD or 8 150 000 JPY, 2012 est.)
- Windows Azure Research Award (2013)
- **From:** Microsoft Research
 - **Description:** The first group of 32 awards given by Microsoft (1000 applications). Gives a generous access to Microsoft Azure (in my case, Linux VMs) for research purpose.
 - **Proposal:** *Growing Intelligence with Cloud Markov Logic.*
 - **Value:** >40 000 USD.
- NVIDIA hardware donation program (2014)
- **Description:** I was awarded an NVIDIA card for high-performance computing.
 - **Proposal:** *Transfer Learning, Deep Learning, and the Puzzle of Biodiversity.*

REFEREED JOURNAL PUBLICATIONS

- [1] **P Desjardins-Proulx**, D Gravel, T Poisot. Deep Learning Transfer in Metagenomics.
In Preparation.
- [2] **P Desjardins-Proulx**, D Gravel, T Poisot. Deep Ecology: Transfer from Ecological Theory to Deep Neural Networks.
In Preparation.
- [3] **P Desjardins-Proulx**, D Gravel, T Poisot. Ecological Interactions and the Netflix Problem.
Submitted.
- [4] **P Desjardins-Proulx**, EP White, JJ Adamson, K Ram, T Poisot, and D Gravel. The case for open preprints in biology.
PLoS Biology 11(5): e1001563
- [5] R Vergilino, TA Elliott, **P Desjardins-Proulx**, TJ Crease and F Dufresne. Evolution of a transposon in *Daphnia* hybrid genomes. *Mobile DNA* 4-7, 2013.
DOI: [10.1186/1759-8753-4-7](https://doi.org/10.1186/1759-8753-4-7)
- [6] D Ai, **P Desjardins-Proulx**, C Chu, and G Wang. The influence of immigration and dispersal limitation on the repeatability of niche and neutral communities.
PLOS ONE 7(9): e46164, 2012.
DOI: [10.1371/journal.pone.0046164](https://doi.org/10.1371/journal.pone.0046164)
- [7] **P Desjardins-Proulx** and D Gravel. A complex speciation-richness relationship in a simple neutral model. *Ecology and Evolution* 2(8): 1781–1790, 2012.
DOI: [10.1002/ece3.292](https://doi.org/10.1002/ece3.292)
- [8] **P Desjardins-Proulx** and D Gravel. How likely is speciation in neutral ecology?
The American Naturalist 179(1):137-144, 2012.
DOI: [10.1086/663196](https://doi.org/10.1086/663196)

OTHER CONTRIBUTIONS	<p>[9] P Desjardins-Proulx. The case for arXiv and a broader conception of peer-reviews. Invited blog, International Network of Next-Generation Ecologists, 2012. http://www.innge.net/?q=node/330.</p> <p>[10] P Desjardins-Proulx, JL Rosindell, T Poisot, and D Gravel. A simple model to study phylogeographies and speciation patterns in space, 2012. arXiv: 1203.1790.</p> <p>[11] P Desjardins-Proulx. A foot in the neutral trap. Invited comment for <i>Trends in Ecology & Evolution</i>, 2012.</p> <p>[12] P Desjardins-Proulx. L'origine de la Biodiversité. Le Mouton Noir, Mai-Juin. Cahier Spécial sur la Biodiversité p.2, 2010. <i>Selected and republished by Gaia-Presse, a group sponsored by the Université Laval</i>.</p>
JOB EXPERIENCES	<p>Research Professional, Canada Research Chair on Terrestrial Ecosystem</p> <ul style="list-style-type: none"> • From 2009 to 2012. • Supervisor: Dr. Dominique Gravel • Responsabilities: Programming high-performance simulations in C, C++, and CUDA on a distributed cluster (Xeon processors + Tesla cards); Design ecological models to understand biodiversity; Teaching scientific computing to graduate students (C, C++, CUDA, UNIX tools).
TEACHING EXPERIENCES	<p>Université du Québec, Québec, Canada.</p> <ul style="list-style-type: none"> • 2013. I organized a series of meetings on information theory and inference. • 2012. CUDA training (intensive one-day course). • 2012. Scientific computing with C and C++ (grad. students/post-docs). • 2011. Scientific computing with C and C++ (grad. students/post-docs).
REFeree SERVICE	<p><i>Physica A: Statistical Mechanics and its Applications; Molecular Ecology Ressources; Methods in Ecology and Evolution; Ecology Letters; Journal of Theoretical Biology; Theoretical Ecology; Acta Biotheoretica; The American Naturalist; Journal of Plant Ecology.</i></p>
PROFESSIONAL MEMBERSHIPS	<ul style="list-style-type: none"> • Institute of Electrical and Electronics Engineers 2012–... • Quebec Center for Biodiversity Science 2012–... • Society for the Study of Evolution 2008–2012
PROGRAMMING SKILLS	<p>I have some experience with many programming languages, libraries, frameworks. I only list here my current working tools:</p> <ul style="list-style-type: none"> • Languages: C++11/14, C, Python, Scala, JavaScript/NodeJs, Java, basic R, Rust & Haskell. • High-performance computing: CUDA, OpenCL, OpenMP, basic ZeroMQ. • Databases: SQL (especially PostgreSQL), Cassandra, MongoDB. • Operating Systems: Linux (mostly Debian/Ubuntu-based). • Cloud: Azure, Amazon. • Writing: L^AT_EX 2_ε.
GRADUATE COURSES	<ul style="list-style-type: none"> • 2015. Business Intelligence [A, 3 credits] Athabasca • 2013. Advanced Distributed Computing [A, 3 credits] Athabasca • 2012. Datamining (machine learning) [A, 4 credits] UIC • 2011. Biostatistics [A, 4 credits] UIC • 2010. Intro. to bioinformatics [A, 4 credits] UIC

- 2010. Reading course on Ancestral Recombination Graphs [A+, 3 credits] [UQAR](#)

ONLINE
COURSES

- 2014. Technology Entrepreneurship

NovoEd/Stanford

REFEREES

On request.