

# Philippe Desjardins-Proulx

January 30, 2015

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CURRENT POSITION	Ph.D. candidate, Poisot Lab, Université de Montréal, Canada, Quebec Center for Biodiversity Science, Canada, Université du Québec à Montréal, 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"><li>• <b>Machine Learning:</b> 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'm using both deep learning &amp; statistical relational learning algorithms. I'm also very interested in and autonomous (reinforcement learning) agents.</li><li>• <b>Scientific computing:</b> 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.</li><li>• <b>Ecology:</b> I have contributed to theoretical evolutionary ecology (speciation, community ecology) and worked with several biological data-sets.</li></ul>
EDUCATION	<b>Department of Biology, Université du Québec à Montréal, Montréal, Canada.</b> Ph.D., September 2012 – December 2015 [expected] <ul style="list-style-type: none"><li>• <b>Thesis Proposal:</b> <i>Deep learning, transfer, and the problem of biodiversity</i></li><li>• <b>Adviser:</b> Dr. Dominique Gravel</li><li>• <b>Co-adviser:</b> Dr. Timothée Poisot</li><li>• <b>Area of Study:</b> Machine learning, ecology, population genetics.</li><li>• <b>Comprehensive exam:</b> Maximum Entropy in Ecology &amp; Evolution.</li><li>• <b>Courses:</b> Advanced Distributed Computing (A13), Business Intelligence (S15).</li></ul> <b>College of Engineering, University of Illinois at Chicago, Chicago, USA.</b> Graduate Certificate in Bioinformatics, 2012, <ul style="list-style-type: none"><li>• <b>Area of Study:</b> Data Mining &amp; biostatistics.</li></ul> <b>Université du Québec, Québec, Canada.</b> B.S., 2009, <ul style="list-style-type: none"><li>• Major in Biology,</li><li>• Minor in Mathematics &amp; Computer Science.</li></ul>

AWARDS	<p>Alexander Graham Bell Graduate Scholarship (2012)</p> <ul style="list-style-type: none"> <li>• <b>From:</b> Natural Sciences and Engineering Research Council of Canada</li> <li>• <b>Description:</b> Most competitive Canadian scholarship in science.</li> <li>• <b>Value:</b> 105 000 CAD (equivalent to 105 000 USD or 8 150 000 JPY, 2012 est.)</li> </ul> <p>Windows Azure Research Award (2013)</p> <ul style="list-style-type: none"> <li>• <b>From:</b> Microsoft Research</li> <li>• <b>Description:</b> The first group of 32 awards given by Microsoft ( 1000 applications). Gives a generous access to Microsoft Azure for research purpose.</li> <li>• <b>Proposal:</b> <i>Growing Intelligence with Cloud Markov Logic.</i></li> <li>• <b>Value:</b> &gt;40 000 USD.</li> </ul> <p>NVIDIA hardware donation program (2014)</p> <ul style="list-style-type: none"> <li>• <b>Description:</b> I was awarded a NVIDIA card for high-performance computing.</li> <li>• <b>Proposal:</b> <i>Transfer Learning, Deep Learning, and the Puzzle of Biodiversity.</i></li> </ul>
<p>REFEREED JOURNAL PUBLICATIONS</p>	<p>[1] <b>P Desjardins-Proulx</b>, EP White, JJ Adamson, K Ram, T Poisot, and D Gravel. The case for open preprints in biology. <i>PLoS Biology</i> 11(5): e1001563</p> <p>[2] R Vergilino, TA Elliott, <b>P Desjardins-Proulx</b>, TJ Crease and F Dufresne. Evolution of a transposon in <i>Daphnia</i> hybrid genomes. <i>Mobile DNA</i> 4-7, 2013. DOI: <a href="https://doi.org/10.1186/1759-8753-4-7">10.1186/1759-8753-4-7</a></p> <p>[3] D Ai, <b>P Desjardins-Proulx</b>, C Chu, and G Wang. The influence of immigration and dispersal limitation on the repeatability of niche and neutral communities. <i>PLOS ONE</i> 7(9): e46164, 2012. DOI: <a href="https://doi.org/10.1371/journal.pone.0046164">10.1371/journal.pone.0046164</a></p> <p>[4] <b>P Desjardins-Proulx</b> and D Gravel. A complex speciation-richness relationship in a simple neutral model. <i>Ecology and Evolution</i> 2(8): 1781–1790, 2012. DOI: <a href="https://doi.org/10.1002/ece3.292">10.1002/ece3.292</a></p> <p>[5] <b>P Desjardins-Proulx</b> and D Gravel. How likely is speciation in neutral ecology? <i>The American Naturalist</i> 179(1):137-144, 2012. DOI: <a href="https://doi.org/10.1086/663196">10.1086/663196</a></p>
<p>OTHER CONTRIBUTIONS</p>	<p>[6] <b>P Desjardins-Proulx</b>. The case for arXiv and a broader conception of peer-reviews. Invited blog, International Network of Next-Generation Ecologists, 2012. <a href="http://www.innge.net/?q=node/330">http://www.innge.net/?q=node/330</a>.</p> <p>[7] <b>P Desjardins-Proulx</b>, JL Rosindell, T Poisot, and D Gravel. A simple model to study phylogeographies and speciation patterns in space, 2012. arXiv: 1203.1790.</p> <p>[8] <b>P Desjardins-Proulx</b>. A foot in the neutral trap. Invited comment for <i>Trends in Ecology &amp; Evolution</i>, 2012.</p> <p>[9] <b>P Desjardins-Proulx</b>. 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>
<p>JOB EXPERIENCES</p>	<p><b>Research Professional, Canada Research Chair on Terrestrial Ecosystem</b></p> <ul style="list-style-type: none"> <li>• From 2009 to 2012.</li> <li>• <b>Supervisor:</b> Dr. Dominique Gravel</li> </ul>

- **Responsabilities:** Programming high-performance simulations in C, C++, and CUDA on a distributed cluster; Design of ecological models to understand biodiversity; Teaching scientific computing to graduate students (C, C++, Python, UNIX tools).

#### TEACHING EXPERIENCES

##### **Université du Québec, Québec, Canada.**

- 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

*Physica A: Statistical Mechanics and its Applications; Ecology Letters, Journal of Theoretical Biology; Theoretical Ecology; Acta Biotheoretica; Molecular Ecology Ressources; The American Naturalist; Journal of Plant Ecology.*

#### PROFESSIONAL MEMBERSHIPS

- Institute of Electrical and Electronics Engineers 2012–...
- Quebec Center for Biodiversity Science 2012–...
- Society for the Study of Evolution 2008–2012

#### PROGRAMMING SKILLS

I have some experience with many programming languages, libraries, frameworks. I only list here my current working tools:

- **Languages:** C (C89, C99, CUDA C, OpenCL), C++11/14, Clojure, Haskell, JavaScript (NodeJS), F#.
- **Databases:** PostgreSQL, MySQL, MongoDB.
- **Operating Systems:** Linux (mostly Debian/Ubuntu-based), Windows, UNIX (OSX).
- **Writing:** L<sup>A</sup>T<sub>E</sub>X 2<sub>ε</sub>.

#### GRADUATE COURSES

- 2015. Business Intelligence [in progress] Athabasca
- 2013. Advanced Distributed Computing [3 credits] Athabasca
- 2012. Datamining (machine learning) [4 credits] UIC
- 2011. Biostatistics [4 credits] UIC
- 2010. Intro. to bioinformatics [4 credits] UIC
- 2010. Reading course on Ancestral Recombination Graphs [3 credits] UQAR

#### ONLINE COURSES

- 2014. Technology Entrepreneurship NovoEd/Stanford

#### REFEREES

On request.