Philippe Desjardins-Proulx

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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

- **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'm also very interested in deep learning and autonomous (reinforcement learning) agents.
- **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 on the Canada Research Chair on Terrestrial Ecosystems' scientific cluster.
- **Ecology:** I have contributed to theoretical evolutionary ecology (speciation, community ecology) and worked with several biological data-sets.

Education

Department of Biology, Université du Québec à Montréal, Montréal, Canada.

Ph.D., September 2012 – December 2015 [expected]

- **Thesis Proposal**: *Deep learning, transfer, and the problem of biodiversity*
- **Adviser**: Dr. Dominique Gravel
- **Co-adviser**: Dr. Timothée Poisot
- **Area of Study**: Machine learning, ecology, population genetics.
- **Comprehensive exam**: Maximum Entropy in Ecology & Evolution.
- **Courses**: Advanced Distributed Computing (A13).

College of Engineering, University of Illinois at Chicago, Chicago, USA.

Graduate Certificate in Bioinformatics, 2012,

- **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 for research purpose.
- **Proposal:** *Growing Intelligence with Cloud Markov Logic.*
- **Value:** >40 000 USD.

NVIDIA hardware donation program (2014)
- **Description:** I was awarded a NVIDIA card for high-performance computing.
- **Proposal:** *Transfer Learning, Deep Learning, and the Puzzle of Biodiversity.*

Refereed Journal Publications

[1] **P Desjardins-Proulx**. Global Transfer Learning between Arbitrary Sources using Semantic Networks.
In prep.

[2] **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

[3] 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

[4] 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

[5] **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

[6] **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

Other Contributions

[7] **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.

[8] **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.

[9] **P Desjardins-Proulx**. A foot in the neutral trap.
Invited comment for *Trends in Ecology & Evolution*, 2012.

[10] **P Desjardins-Proulx**. L'origine de la Biodiversité. Le Mouton Noir, Mai-Juin. Cahier Spécial sur la Biodiversité p.2, 2010. *Selected and republished by Gaia-Presse, a group sponsored by the Université Laval.*

Job Experiences

Research Professional, Canada Research Chair on Terrestrial Ecosystem

- From 2009 to 2012.
- **Supervisor**: Dr. Dominique Gravel
- **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**: Haskell, C (C99, CUDA C, OpenCL), F#, C++.
- **Databases**: MongoDB, Couchbase, Cassandra, PostgreSQL.
- **Operating Systems**: Linux (mostly Debian/Ubuntu-based), Windows, UNIX (OSX).
- **Writing**: LaTeX 2_ε.

Graduate Courses

- 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.