Philippe Desjardins-Proulx

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CURRENT POSITION: Ph.D. candidate,
Université du Québec à Montréal, Canada,
Quebec Center for Biodiversity Science, McGill University, 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 deep 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 rely on graphical models and techniques from natural language processing.
- **Scientific computing:** Almost all my undergraduate projects were done on scientific computing applied to biology and I worked 4 years (2009-2012) as a research professional, focusing on C/C++/CUDA simulations 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 –

- **Thesis Proposal**: *Achieving deep transfer learning with semantic networks, with applications to species distribution modeling*
- **Adviser**: Dr. Dominique Gravel
- **Area of Study**: Machine learning; Natural Language Processing; Probabilistic Graphical Models; Ecology.
- **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$ (equivalent to 105 000 USD or 8 150 000 JPY, 2012 est.)

Windows Azure Research Award (2013)
- **From:** Microsoft Research
- **Description:** Access to the Windows Azure cloud for selected science proposals.
- **Proposal:** *Growing Intelligence with Cloud Markov Logic.*
- **Value:** >40 000 USD.

Current projects

Shinka
- **Description:** Machine learning engine for deep learning transfer.
- **Technologies:** Haskell

Scriptoria
- **Description:** A website to track science manuscripts written using revision control systems.
- **Technologies:** Node.Js & MongoDB

Gakusei
- **Description:** An API for Japanese natural language processing.
- **Technologies:** Node.Js & MongoDB

Refereed Journal Publications

[1] **P Desjardins-Proulx**. Achieving Deep Transfer Learning with Markov Logic and Semantic Networks.
In prep.

[2] **P Desjardins-Proulx** and T Poisot. Scriptoria: a website to track manuscripts in public revision control systems.
In prep.

[3] **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

[4] 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

[5] 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

[6] **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

[7] **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

[8] **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.

[9] **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.

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

[11] **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.

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; Journal of Theoretical Biology; Theoretical Ecology; Acta Biotheoretica; Molecular Ecology Ressources; Journal of Plant Ecology.

Professional Memberships

- Institute of Electrical and Electronics Engineers 2012–...
- Quebec Center for Biodiversity Science 2012–...

Programming skills

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

- **Languages**: Haskell, JavaScript (NodeJS), Julia, C++, C, Java.
- **Databases**: MongoDB, PostgreSQL.
- **Operating Systems**: Linux.

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

Referees

On request.