Philippe Desjardins-Proulx

October 29, 2013

CURRENT POSITION
Ph.D. candidate,
Department of biology, Université du Québec à Montréal, Canada,
Quebec Center for Biodiversity Science, McGill University, Canada.

CONTACT
email: phdp@outlook.com
email (alt.): philippe.d.proulx@gmail.com
phone: +1-418-732-9877
skype: philippe.desjardins-proulx
www: http://phdp.github.io/
github: https://github.com/phdp/

CITIZENSHIP
Canada

LANGUAGES
FRENCH: Fluent (*writing & speaking*)
ENGLISH: Full professional proficiency (*writing & speaking*)
JAPANESE: Limited working proficiency (*writing only*)

EXPERTISE

- **Machine learning and transfer learning:** My thesis focuses on inference with probabilistic graphical models (Markov logic networks) and the problem of transfer learning. Deep transfer learning could be described as the capacity to automatically transfer knowledge between different tasks. It comes naturally to us, e.g.: we use what we learned for walking when learning to run, but almost all machine learning algorithms build models from nothing. Effective transfer learning will allow us to design Artificial Intelligences capable of growing powerful expertise in ecology, medicines, etc...
- **Scientific computing:** Almost all my undergraduate projects were done on scientific computing in 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. I have implemented several complex algorithms, including high quality random number generators and evolutionary algorithms. I'm particularly interested in the design and deployment of machine learning and artificial intelligence algorithms on distributed systems.
- **Ecology:** I'm interested in complexity and nothing is more complex than ecosystems. I have contributed to theoretical ecology, in particular on the problem of speciation (the origin of species) and how it relates to the origin of ecological communities.

EDUCATION

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

Ph.D., September 2012 –

- **Thesis Proposal**: *Deep transfer learning with Markov logic networks applied to complex ecosystems*
- **Adviser**: Dr. Dominique Gravel
- **Area of Study**: Machine learning; Artificial Intelligence; Probabilistic Graphical Models; Statistical learning; Learning transfer; Ecology.
- **Courses**: Advanced Distributed Computing (A13); Cloud Computing (W14); Business Intelligence (S14).

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

Graduate Certificate in Bioinformatics, 2012,

- **Area of Study**: Machine learning & biostatistics.

Université du Québec, Québec, Canada.

B.S., 2009,

- Major in Biology,
- Minor in Mathematics & Computer Science.

Awards & Grants

Award: 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.)

Grant: Windows Azure Research Award Program (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.

Refereed Journal Publications

[1] **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

[2] 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

[3] 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

[4] **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

[5] **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

[6] **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.

[7] **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.

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

[9] **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

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

Computer Skills

- **Programming languages:**
  - **Advanced:** C, C++, Clojure, Java.
  - **Intermediate:** Common Lisp, Haskell, F#, Python, Ruby, R, JavaScript.
- **Others:**
  - **Operating systems:** Linux (Debian/Ubuntu, Arch, RedHat).
  - **Databases:** PostgreSQL, MongoDB, MySQL, SQLite.
  - **Cloud services:** PaaS: Heroku, IaaS: Azure, HP.
- **Web sites:**
  - Personal page: http://phdp.github.io.
  - TEE's website: http://chaire-eec.uqar.ca.

Professional Memberships

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

Graduate Courses

- 2013. Advanced Distributed Computing [*in progress*] 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