# Ronan Le Bras

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**Current Position**

**Allen Institute for Artificial Intelligence** June 2016 - now
*Research Scientist*

**Education**

**Ph.D.** in Computer Science 2009 - 2016
**Cornell University**, Ithaca NY, USA

Advisor: Prof. Carla P. Gomes
Committee: Prof. Carla P. Gomes, Prof. Bart Selman, Prof. John E. Hopcroft
Thesis: *Leveraging Human Insights into Problem Structure for Scientific Discovery*

**M.S.** in Computer Engineering 2008 - 2009
**Ecole Polytechnique Montreal**, Montreal QC, Canada

Advisor: Prof. Gilles Pesant
Thesis: *Applying Probabilistic Message-Passing Algorithms to Search Heuristics for Solving Constraint Satisfaction Problems*
**Nominated for the best 2010 University Master's Thesis**

**B.Eng.** in Software Engineering 2004 - 2008
**Ecole Polytechnique Montreal**, Montreal QC, Canada
**Degree with highest honors**

**C.P.G.E.** in Mathematics and Physics 2001 - 2004
**Montaigne**, Bordeaux, France

**Research Interests**

Commonsense Reasoning; Natural Language Understanding; Computational Sustainability; Combinatorial Optimization; Artificial Intelligence;
Automated Reasoning; Big Data; Machine Learning; Bayesian Inference;
Human Computation; Crowdsourcing

**Scholarships**

**Alexander Graham Bell Canada Graduate Scholarship** 2009 - 2010
Natural Sciences and Engineering Research Council of Canada (NSERC)

**Masters Research Scholarship** 2009 - 2010
Fonds québécois de la recherche sur la nature et les technologies (FQRNT)

**J.A. Desève Funds Scholarship** 2009
Fonds J.A. Desève

**Scholarship for excellence in Master's program** 2008 - 2009
Interuniversity Research Centre on Enterprise Networks, Logistics and Transportation (CIRRELT)

**Scholarship for excellence** 2004
Rotary International, The Rotary Foundation

**Teaching Experience**

**Teaching Assistant** Spring 2016
Cornell University, Department of Computer Science
Head TA for the course *Introduction to Analysis of Algorithms*

**Guest Lecturer** Spring 2013
Cornell University, Department of Computer Science
Graduate course, *Topics in Computational Sustainability*

**Teaching Assistant** Fall 2010
Cornell University, Department of Computer Science
Review sessions and office hours in *Artificial Intelligence*
**TA Award of Excellence**

**Teaching Assistant** Jan-Dec 2007
University of HEC Montreal, Department of Quantitative Methods
Lectures and tutorials in *Probability and Statistics*

**Teaching Assistant** Jan-Dec 2007
Ecole Polytechnique Montreal, Department of Computer Science
Lectures and lab sessions in *Computer Architecture*
Lab sessions in *Programming Language* (C++)

## Research & Development Experience

**Cornell University** 2009 - 2016
*Research Assistant to Prof. Carla P. Gomes* *full-time*
Research in Computational Sustainability

**Ecole Polytechnique Montreal** Jan-Apr 2008
*Research Assistant to Prof. Gilles Pesant* *part-time*
Research on constraint-centered search heuristics for combinatorial problems

**Caisse de dépôt et placement du Québec** May-Aug 2007
*Intern, Market-risk Department* *full-time*
Improvement of market data processes; automation of financial portfolio values computation

**Univoc Services Inc.** May-Dec 2006
*Scientific Programmer, R&D Department* *full-time*
Numerical designs for a speech-recognition analyzer system based on Monte-Carlo simulations; integration of numerical functions within a graphical user interface

## Professional Service

**PC member**
AAAI 2011/2017/2018/2019/2020
CPAIOR 2013
IJCAI 2013/2015

**Reviewer**
AAAI 2010/2011/2013-2015/2017-2020
Annals of Mathematics and Artificial Intelligence
CP 2010/2011/2016
CPAIOR 2012-2014
EMNLP 2020
IJCAI 2013/2015/2020
INFORMS Journal of Computing
ITCAI 2010
Journal of Combinatorial Designs
Journal of Machine Learning Research
NAACL/NeuralGen 2019
NAACL/SemEval 2019
SAT 2013
SIAM Journal on Discrete Mathematics (SIDMA)
SoCS 2013/2014

## Publications

### Conferences and Journals

**[2020]**

[1] **Le Bras**, R., Swayamdipta, S., Bhagavatula, C., Zellers, R., Peters, M. E., Sabharwal, A., and Choi, Y. (2020). Adversarial filters of dataset biases. *ICML*

[2] Bhagavatula, C., **Le Bras**, R., Malaviya, C., Sakaguchi, K., Holtzman, A., Rashkin, H., Downey, D., Yih, S. W.-t., and Choi, Y. (2020). Abductive commonsense reasoning. *ICLR*

[3] Jensen, N., Lyons, E., Chebelyon, E., **Le Bras**, R., and Gomes, C. (2020). Conspicuous monitoring and remote work. *Journal of Economic Behavior and Organization*

[4] Sakaguchi, K., **Le Bras**, R., Bhagavatula, C., and Choi, Y. (2020). Winogrande: An adversarial winograd schema challenge at scale. *AAAI,* ****Outstanding Paper Award****

[5] Bisk, Y., Zellers, R., **Le Bras**, R., Gao, J., and Choi, Y. (2020). Piqa: Reasoning about physical commonsense in natural language. *AAAI*

**[2019]**

[6] Sap, M., Rashkin, H., Chen, D., **Le Bras**, R., and Choi, Y. (2019). Social iqa: Commonsense reasoning about social interactions. *EMNLP*

[7] Huang, L., **Le Bras**, R., Bhagavatula, C., and Choi, Y. (2019). Cosmos qa: Machine reading comprehension with contextual commonsense reasoning. *EMNLP*

[8] Hopkins, M., **Le Bras**, R., Petrescu-Prahova, C., Stanovsky, G., Hajishirzi, H., and Koncel-Kedziorski, R. (2019). Semeval-2019 task 10: Math question answering. In *SemEval@NAACL-HLT*

**[2018]**

[9] Sap, M., **Le Bras**, R., Allaway, E., Bhagavatula, C., Lourie, N., Rashkin, H., Roof, B., Smith, N. A., and Choi, Y. (2018). Atomic: An atlas of machine commonsense for if-then reasoning. In *AAAI*

**[2017]**

[10] Hopkins, M., Petrescu-Prahova, C., Levin, R., **Le Bras**, R., Herrasti, A., and Joshi, V. (2017). Beyond sentential semantic parsing: Tackling the math sat with a cascade of tree transducers. In *EMNLP*

[11] Xue, Y., Bai, J., **Le Bras**, R., Rappazzo, B., Bernstein, R., Bjorck, J., Longpre, L., Suram, S. K., van Dover, R. B., Gregoire, J., et al. (2017). Phase-mapper: An AI platform to accelerate high throughput materials discovery. In *the 29th Conference on Innovative Applications of Artificial Intelligence*, IAAI'17, ****IAAI Innovative Application Award****

[12] Diaz, M., **Le Bras**, R., and Gomes, C. P. (2017). In search of balance: The challenge of generating balanced latin rectangles. In *the Fourteenth International Conference on Integration of Artificial Intelligence and Operations Research Techniques in Constraint Programming*, CPAIOR'17

[13] Suram, S. K., Xue, Y., Bai, J., **Le Bras**, R., Rappazzo, B., Bernstein, R., Bjorck, J., Zhou, L., van Dover, R. B., Gomes, C. P., et al. (2016). Automated phase mapping with agilefd and its application to light absorber discovery in the V–Mn–Nb oxide system. *ACS Combinatorial Science*

**[2016]**

[14] Xue, Y., Ermon, S., **Le Bras**, R., Gomes, C. P., and Selman, B. (2016). Variable elimination in the fourier domain. In *the 33rd International Conference on Machine*

*Learning*, ICML'16

**[2015]**

[15] Zou, T., **Le Bras**, R., Salles, M., Demers, A., and Gehrke, J. (2015). Cloudia: a deployment advisor for public clouds. *The VLDB Journal, ***Special Issue on the Best Papers of VLDB 2013****

[16] Ermon, S., **Le Bras**, R., Suram, S. K., Gregoire, J. M., Gomes, C. P., Selman, B., and van Dover, R. B. (2015). Pattern decomposition with complex combinatorial constraints: Application to materials discovery. In *the 29th Conference on Artificial Intelligence*, AAAI'15

**[2014]**

[17] **Le Bras**, R., Xue, Y., Bernstein, R., Gomes, C. P., and Selman, B. (2014). A human computation framework for boosting combinatorial solvers. In *the 2nd AAAI Conference on Human Computation and Crowdsourcing*, HCOMP'14

[18] **Le Bras**, R., Gomes, C. P., and Selman, B. (2014). On the erdos discrepancy problem. In *the 20th International Conference on Principles and Practice of Constraint Programming*, CP'14

[19] **Le Bras**, R., Bernstein, R., Gregoire, J. M., Suram, S. K., Gomes, C. P., Selman, B., and van Dover, R. B. (2014). A computational challenge problem in materials discovery: Synthetic problem generator and real-world datasets. In *the 28th Conference on Artificial Intelligence*, AAAI'14

**[2013]**

[20] **Le Bras**, R., Bernstein, R., Gomes, C. P., and Selman, B. (2013). Crowdsourcing backdoor identification for combinatorial optimization. In *the 23rd International Joint Conference on Artificial Intelligence*, IJCAI'13

[21] **Le Bras**, R., Gomes, C. P., and Selman, B. (2013). Double-wheel graphs are graceful. In *the 23rd International Joint Conference on Artificial Intelligence*, IJCAI'13

[22] Zou, T., **Le Bras**, R., Salles, M. V., Demers, A., and Gehrke, J. (2013). Cloudia: a deployment advisor for public clouds. In *the 39th International Conference on Very Large Data Bases*, VLDB'13

[23] **Le Bras**, R., Dilkina, B., Xue, Y., Gomes, C. P., McKelvey, K. S., Montgomery, C., and Schwartz, M. K. (2013). Robust network design for multispecies conservation. In *the 16th Conference on Artificial Intelligence*, AAAI'13

[24] Dilkina, B., Gomes, C. P., Lai, K., **Le Bras**, R., McKelvey, K. S., Sabharwal, A., Schwartz, M. K., Suter, J., and Xue, Y. (2013). Large conservation landscape - synthetic and real-world datasets. In *the 16th Conference on Artificial Intelligence*, AAAI'13

[25] Finger, M., **Le Bras**, R., Gomes, C. P., and Selman, B. (2013). Solutions for hard and soft constraints using optimized probabilistic satisfiability. In *the 16th International Conference on Theory and Applications of Satisfiability Testing*, SAT'13

**[2012]**

[26] **Le Bras**, R., Gomes, C. P., and Selman, B. (2012). From streamlined combinatorial search to efficient constructive procedures. In *the 15th Conference on Artificial Intelligence*, AAAI'12

[27] **Le Bras**, R., Ermon, S., Damoulas, T., Bernstein, R., Gomes, C., Selman, B., and

van Dover, R. B. (2012). Materials discovery: New opportunities at the intersection of constraint reasoning and learning. In *International Conference on Computational Sustainability*, CompSust'12

[28] Ermon, S., **Le Bras**, R., Gomes, C. P., Selman, B., and van Dover, R. B. (2012). Smt-aided combinatorial materials discovery. In *the 15th International Conference on Theory and Applications of Satisfiability Testing*, SAT'12

**[2011]**

[29] **Le Bras**, R., Damoulas, T., Gregoire, J. M., Sabharwal, A., Gomes, C. P., and van Dover, R. B. (2011). Constraint reasoning and kernel clustering for pattern decomposition with scaling. In *the 17th International Conference on Principles and Practice of Constraint Programming*, CP'11

**[2009]**

[30] **Le Bras**, R., Zanarini, A., and Pesant, G. (2009). Efficient generic search heuristics within the embp framework. In *the 15th International Conference on Principles and Practice of Constraint Programming*, CP'09

### Workshops

**[2012]**

[31] **Le Bras**, R., Bernstein, R., Gomes, C. P., Selman, B., and van Dover, R. B. (2012). Human computation for combinatorial materials discovery. In *the Human Computation for Science and Computational Sustainability NIPS Workshop*, HCSCS'12

**[2010]**

[32] **Le Bras**, R., Damoulas, T., Gregoire, J. M., Sabharwal, A., Gomes, C. P., and van Dover, R. B. (2010). Computational thinking for material discovery: Bridging constraint reasoning and learning. In *the 2nd International Workshop on Constraint Reasoning and Optimization for Computational Sustainability*, CROCS'10

### Technical Reports

**[2012]**

[33] **Le Bras**, R., Perrault, A., and Gomes, C. (2012). Polynomial time construction for spatially balanced latin squares. Technical report, http://hdl.handle.net/1813/28697, "eCommons Cornell University"

## References

**Carla P. Gomes, Ph.D.**
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