Maxime Gasse
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Montréal (Québec)
CANADA

Machine Learning Researcher

Education

2017 **PhD in Machine Learning** - University of Lyon
Probabilistic graphical model structure learning, multi-label classification

2012 **MSc in Artificial Intelligence** - University of Lyon
Machine learning, bio-inspired computing, combinatorial problems, semantic web

2011 **Engineer in Computer Science** - CPE Lyon
Mathematics, electronics, system architecture, signal processing, cryptography

Professional Experience

2018 - now **Postdoc at MILA/CERC** - GERAD postdoctoral research fellowship
Supervised by Laurent Charlin and Andrea Lodi
Deep learning for combinatorial optimization

2017 **Postdoc at CREATIS** - Labex PRIMES grant
Supervised by Fabien Millioz and Denis Friboulet
Deep learning for ultrafast ultrasound imaging

2013 - 2016 **PhD at LIRIS** - EU FP7 INTEGRATE grant
Supervised by Haytham Elghazel and Alexandre Aussem
Cycle time prediction of manufacturing equipments (STMicroelectronics)

2008 - 2011 **IT Engineer at Logica**
JEE development for radioactive monitoring in nuclear power plants (EDF)
Oracle data warehouse design with automated KPI reporting (Carrefour France)

Teaching

2017 - 2018 **Machine Learning**, 5th year engineers, CPE Lyon (14h full teacher incl. materials)

C programming, 4th year engineers, CPE Lyon (24h TA)

2016 - 2017 **Probabilistic Graphical Models**, MSc., University of Lyon (8h TA)

2013 - 2016 **Algorithmics and programming**, University of Lyon (172h TA)

2013 - 2014 **Java / Object-Oriented programming**, CPE Lyon (24h TA)

Publications

Peer-reviewed conferences and journals

On the effectiveness of two-step learning for latent generative models.
Subakan, C. and **Gasse, M.** and Charlin, L.
International Joint Conferences on Artificial Intelligence (IJCAI), submitted

On Generalized Surrogate Duality in Mixed-Integer Nonlinear Programming.
Müller, B. and Muñoz, G. and **Gasse, M.** and Gleixner, A. and Lodi, A. and Serrano, F.
Conference on Integer Programming and Combinatorial Optimization (IPCO), 2020

Exact combinatorial optimization with graph convolutional neural networks.
Gasse, M. and Chetelat, D. and Ferroni, N. and Charlin, L. and Lodi, A.
Advances in Neural Information Processing Systems (NeurIPS), 2019

On the use of binary stochastic autoencoders for multi-label classification under the zero-one loss.
Lecoeuche, D. and Aussem, A. and **Gasse, M.**
INNS Big Data and Deep Learning (INNS BDDL), 2018

High-quality plane wave compounding using convolutional neural networks.
Gasse, M. and Millioz, F. and Roux, E. and Garcia, D. and Liebgott, H. and Friboulet, D.
IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control (TUFFC), 2017

Probabilistic graphical model structure learning : application to multi-label classification.
PhD Thesis, Université de Lyon, 2017

F-measure maximization in multi-label classification with conditionally independent label subsets.
Gasse, M. and Aussem, A.
European Conference on Machine Learning (ECML-PKDD), 2016

Identifying the irreducible disjoint factors of a multivariate probability distribution.
Gasse, M. and Aussem, A.
Conference on Probabilistic Graphical Models (PGM), 2016

On the optimality of multi-label classification under subset zero-one loss for distributions satisfying the composition property.
Gasse, M. and Aussem, A. and Elghazel, H.
International Conference on Machine Learning (ICML), 2015

A hybrid algorithm for BN structure learning with application to multi-label learning.
Gasse, M. and Aussem, A. and Elghazel, H.
Expert Systems With Applications (ESWA), 2014

Analysis of risk factors of hip fracture with causal Bayesian networks.
Aussem, A. and Caillet, P. and Klemm, S. and **Gasse, M.** and Schott, A.M. and Ducher, M.
International Work-Conference on Bioinformatics and Biomedical Engineering (IWBBIO), 2014

Optimal sensor locations for polymer injection molding process.
Le Goff, R. and Garcia, D. and **Gasse, M.** and Aussem, A.
European Scientific Association for Material Forming (ESAFORM), 2014

An experimental comparison of hybrid algorithms for Bayesian network structure learning.
Gasse, M. and Aussem, A. and Elghazel, H.
European Conference on Machine Learning (ECML-PKDD), 2012

Non peer-reviewed conference communications

Learning to Branch With Graph Convolutional Neural Networks.
Gasse, M. and Chetelat, D. and Charlin, L. and Lodi, A.
Institute for Operations Research and the Management Sciences Annual Meeting (INFORMS), 2019

Reinforcement Learning of Branching Strategies.
Gasse, M. and Chetelat, D. and Charlin, L. and Lodi, A.
Institute for Operations Research and the Management Sciences Annual Meeting (INFORMS), 2018

Accelerating plane wave imaging through deep learning-based reconstruction: an experimental study.
Gasse, M. and Millioz, M. and Roux, E. and Liebgott, H. and Friboulet, D.
IEEE International Ultrasonics Symposium (IUS), 2017

Algorithmes de factorisation d'une loi de probabilité jointe en facteurs indépendants et minimaux.
Gasse, M. and Aussem, A.
Journées Francophones des Réseaux Bayésiens (JFRB), 2016

On the factorization of the label conditional distribution in the context of multi-label classification.
Gasse, M. and Aussem, A. and Elghazel, H.
Workshop on Big Multi-Target Prediction (ECML-PKDD workshop), 2015

Invited Talks

Data-Driven Combinatorial Optimization.
Schloss Dagstuhl Seminar 20421, Leibniz Center for Informatics, 2020 - to be held

Learning to branch in MILP solvers.
TTI-C Workshop on Automated Algorithms Design, 2019

Ultrasound image reconstruction using deep learning: a new paradigm.
IEEE IUS, 2018

Seminars

Introduction to deep learning.
Canadian Operational Research Society (CORS), 2020 - to be held

Introduction to machine learning.
School on Column Generation, Centre de Recherches Mathématiques (CRM), 2020 - to be held

Learning to branch.
Konrad-Zuse-Zentrums für Informationstechnik Berlin (ZIB), 2019

Machine learning crash course.
Konrad-Zuse-Zentrums für Informationstechnik Berlin (ZIB), 2019

Statistical learning for combinatorial optimization.
Polytechnique Montréal, Génie Informatique et Génie Logiciel (GIGL) department, 2019

Machine learning crash course.
Groupe d'Etudes et de Recherche en Analyse de Décisions (GERAD), 2018

Introduction to machine learning.
Centre de Recherche en Acquisition et Traitement de l'Image pour la Santé (CREATIS), 2017

Introduction to machine learning.
Laboratoire d'InfoRmatique en Image et Systèmes d'information (LIRIS), 2016

Technical skills

Programming	**C, C++, Python, R**, Java, C#
Databases	Oracle (PlSQL), PostgreSQL (Pg/PlSQL), MySQL, SQLite
Web	XHTML, CSS, PHP, Java (JEE, EJB, JSF)
Systems	Linux (RedHat, Debian), UNIX, Windows NT
Others	Real-time 8051 (assembly/C), Android (Java)

Miscellaneous

Reviewing	ESWA, IJAR, **NeurIPS,** IEEE TUFFC, Ultrasonics, INFORMS Journal of Optimization, IEEE ICRA, MAIS (Montreal AI symposium)
Grants	**Postdoctoral fellowship** GERAD 2018 ($25 000)
Supervision	PhD: Defeng Liu (2018-now), Antoine Prouvost (2019-now) MSc: Giacomo Neri (2018), Nicola Ferroni (2018), Denis Lecoeuche (2017) Intern: William Ngo (2019)
Languages	Native **French** speaker Fluent **English** speaker
Interests	Movies, books, board games, video games, climbing. **Open-source** enthusiast (https://github.com/gasse). Passionate about artificial intelligence, physics, science in general.