Jaël Champagne Gareau

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Education

Postdoctoral Research in Computer Science (supervised by Pr. Daniel Lemire)
Université TÉLUQ *2025–*
Title: Efficient generation of decimal character strings from binary floating-point numbers

Ph. D in Computer Science (supervised by Pr. Éric Beaudry and Vladimir Makarenkov) **4.30/4.30**
Université du Québec à Montréal *2019–2024*
Title: Efficient resolution of Markov decision processes by exploiting structural and algorithmic approaches taking advantage of modern computer architecture

M. Sc in Computer Science (supervised by Pr. Éric Beaudry and Vladimir Makarenkov) **4.20/4.30**
Université du Québec à Montréal *2017–2019*
Title: Route planning for electric vehicles with uncertain availability of charging stations

Advanced Certificate in software development **4.30/4.30**
Université du Québec à Montréal *2016–2017*

B. Sc in Pure Mathematics **3.97/4.30**
Université du Québec à Montréal *2013–2016*

College studies in Sciences, Computer Science and Mathematics **R-rank: 32**
Collège de Maisonneuve *2010–2012*

Work and research experiences

Teaching assistant
Université du Québec à Montréal *2016–2024*

○ MAT0339	: General mathematics	F2016
○ INF1132	: Mathematics for computer science	7 contracts between F2017 and S2020
○ INF3105	: Data structures and algorithms	5 contracts between F2019 and F2024
○ INF3135	: Software development and maintenance	5 contracts between S2017 and S2020
○ INF4230	: Artificial Intelligence	4 contracts between F2020 and S2024
○ INF5130	: Design and analysis of algorithms	4 contracts between F2017 and F2021
○ INF5171	: Concurrent and parallel programming	F2021
○ INF6120	: Fonctionnal and logic programming	3 contracts between F2019 and F2020

Lecturer
Université du Québec à Montréal

○ INF3105	: Data structures and algorithms	F2020 et S2024

Research and development of Machine-Learning algorithms
Contrat entre GEVA Solutions et l'Université du Québec à Montréal *2017–2019*

Undergrad research internship in Mathematics (algebraic curves)
Université du Québec à Montréal (CIRGET, ISM), supervised by Pr. Olivier Collin *Summer 2014*

Scholarships and awards

- Doctoral Scholarship from Fonds de Recherche du Québec — Nature et Technologies (FRQNT) 2022–2024
- Alexander Graham-Bell Canada Graduate Scholarship (CGS, NSERC) 2019–2022
- Best paper award (Canadian AI 2022) 2022
- Honorable mention for Masters in Computer Science 2019
- Master Scholarship from Fonds de Recherche du Québec — Nature et Technologies (FRQNT) 2018–2019
- Excellence Scholarship from the Faculty of Sciences of UQAM (granted by Hydro-Québec) 2017–2018

- UQAM's Registrar's Office Scholarship in Computer Science 2017–2018
- Master's recruitment Scholarship from UQAM's Faculty of Sciences 2017–2018
- Inscription on the UQAM's Dean of the Faculty of Sciences' list of excellence 2013–2014

Social experiences and volunteering

Université du Québec à Montréal
President of the student's graduate studies in Computer Sciences' Association (AECSI-UQAM) *2018–2024*

Réseau Technoscience
Volunteer for the evaluation of scientific projects at Montréal and Québec's finals for Expo-Sciences *2018–2024*

Université du Québec à Montréal
Member of the Master and Ph. D Computer Science program Committee *2017–2024*

Intelligent Tutoring Systems (ITS2018); Educational Data Mining (EDM2019)
Member of the organizing committee of Scientific conferences *2018, 2019*

Technical and personal skills

- **Programming languages:** C, C++, Java, Python, Haskell, Prolog
- **Other Computer Science skills:** Algorithms, Data Structures, LaTeX, Linux, Bash
- **General skills:** Professionnal writing of scientific documents, good communication of scientific concepts
- **Linguistic skills:** French (native language), English (advanced)
- **Other:** Good problem-solving skill, Good basis in mathematics (Analysis and Algebra)

Publications

J. Champagne Gareau, É. Beaudry, and V. Makarenkov. Towards topologically diverse probabilistic planning benchmarks: Synthetic domain generation for markov decision processes. In *Classification and Data Science in the Digital Age – IFCS 2024*, Studies in Classification, Data Analysis, and Knowledge Organization, Cham, 2024. Springer International Publishing.

J. Champagne Gareau, G. Gosset, M.-A. Lavoie, É. Beaudry, and V. Makarenkov. Increased plan stability in cooperative electric vehicles path-planning. In *ICAPS 2024 Workshop on Human-Aware Explainable Planning*, 2024. URL `https://openreview.net/forum?id=vtWg28K6Lu`.

J. Champagne Gareau, M.-A. Lavoie, G. Gosset, and E. Beaudry. Cooperative electric vehicles planning. In *Proceedings of the 23rd International Conference on Autonomous Agents and Multiagent Systems*, AAMAS '24, page 290–298, Richland, SC, 2024. International Foundation for Autonomous Agents and Multiagent Systems. ISBN 9798400704864.

J. Champagne Gareau, G. Gosset, É. Beaudry, and V. Makarenkov. Cache-efficient dynamic programming MDP solver. In *Proceedings of the 26th European Conference on Artificial Intelligence (ECAI 2023)*, volume 372 of *Frontiers in Artificial Intelligence and Applications*, pages 373–380, Krakow, 2023. IOS Press. ISBN 978-1-64368-437-6. doi: 10.3233/FAIA230293.

J. Champagne Gareau, É. Beaudry, and V. Makarenkov. Fast and optimal branch-and-bound planner for the grid-based coverage path planning problem based on an admissible heuristic function. *Frontiers in Robotics and AI*, 9, 2023. ISSN 2296-9144. doi: 10.3389/frobt.2022.1076897. URL `https://www.frontiersin.org/articles/10.3389/frobt.2022.1076897`.

J. Champagne Gareau, É. Beaudry, and V. Makarenkov. Cache-efficient memory representation of Markov Decision Processes. In *Proceedings of the Canadian Conference on Artificial Intelligence*, pages 87–96. Canadian Artificial Intelligence Association (CAIAC), 2022. ISBN 978-3-030-91608-4. doi: 10.21428/594757db.0e910d58. URL `https://caiac.pubpub.org/pub/pq25qiqh`.

J. Champagne Gareau, É. Beaudry, and V. Makarenkov. pcTVI: Parallel MDP solver using a decomposition into independent chains. In P. Brito, J. G. Dias, B. Lausen, A. Montanari, and R. Nugent, editors, *Classification and Data Science in the Digital Age – IFCS 2022*, Studies in Classification, Data Analysis, and Knowledge Organization, pages 101–109, Cham, 2023. Springer International Publishing. ISBN 978-3-031-09034-9. doi: 10.1007/978-3-031-09034-9_12.

J. Champagne Gareau, É. Beaudry, and V. Makarenkov. Fast and optimal planner for the discrete grid-based coverage path-planning problem. In H. Yin, D. Camacho, P. Tino, R. Allmendinger, A. J. Tallón-Ballesteros, K. Tang, S.-B. Cho, P. Novais, and S. Nascimento, editors, *Intelligent Data Engineering and Automated Learning – IDEAL 2021*, pages 87–96, Cham, 2021. Springer International Publishing. ISBN 978-3-030-91608-4. doi: 10.1007/978-3-030-91608-4_9.

J. Milot, J. Champagne Gareau, and E. Beaudry. An energy-efficient method with dynamic GPS sampling rate for transport mode detection and trip reconstruction. In C. Goutte and X. Zhu, editors, *Advances in Artificial Intelligence – Canadian AI 2020*, page 408–419, Cham, 2020. Springer International Publishing. ISBN 978-3-030-47357-0. doi: 10.1007/978-3-030-47358-7_42.

Z. Aouabed, M. Abdar, N. Tahiri, J. Champagne Gareau, and V. Makarenkov. A novel effective ensemble model for early detection of coronary artery disease. In M. Serrhini, C. Silva, and S. Aljahdali, editors, *Innovation in Information Systems and Technologies to Support Learning Research*, pages 480–489, Cham, 2020. Springer International Publishing. doi: 10.1007/978-3-030-36778-7_53.

J. Champagne Gareau. Planification d'itinéraires pour véhicule électrique avec disponibilité incertaine des bornes de recharge. Master's thesis, Université du Québec à Montréal, Montréal, 2019. URL `https://archipel.uqam.ca/13780/`.

J. Champagne Gareau, E. Beaudry, and V. Makarenkov. An efficient electric vehicle path-planner that considers the waiting time. In *Proceedings of the 27th ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems*, SIGSPATIAL '19, page 389–397, New York, NY, USA, 2019. ACM. ISBN 9781450369091. doi: 10.1145/3347146.3359064.

J. Champagne Gareau, É. Beaudry, and V. Makarenkov. A fast electric vehicle planner using clustering. In T. Chadjipadelis, B. Lausen, A. Markos, T. R. Lee, A. Montanari, and R. Nugent, editors, *Data Analysis and Rationality in a Complex World – IFCS 2019*, Studies in Classification, Data Analysis, and Knowledge Organization, pages 17–25, Cham, 2021. Springer International Publishing. ISBN 978-3-030-60104-1. doi: 10.1007/978-3-030-60104-1_3.

J. Champagne Gareau, É. Beaudry, and V. Makarenkov. Planification d'itinéraires optimaux pour véhicule électrique en considérant le regroupement de bornes de recharge et leur probabilité d'occupation. In *Actes de conférence des XXV^{e} rencontres de la Société Francophone de Classification (SFC2018)*, pages 5–8, 2018.

J. Champagne Gareau, É. Beaudry, and V. Makarenkov. Planification d'itinéraires pour véhicules électriques, 2018. Présentation d'affiche. Journée de l'informatique cognitive, TELUQ.

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Jaël Champagne Gareau