Jean-François Tremblay

2nd year Ph.D. candidate, AI and robotics researcher
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EDUCATION

McGill University *September 2019 - Present*
Ph.D., computer science
Supervised by Professor David Meger

Université Laval *September 2017 - August 2019*
Research M.Sc., computer science GPA: 4.11/4.33
Thesis: Forest inventory with lidar-equipped robot for difficult environments
Supervised by Professor Philippe Giguère and Professor Martin Béland

Université Laval *September 2014 - May 2017*
B.Sc., mathematics and computer science GPA: 3.20/4.33

JOURNAL PUBLICATIONS

Jean-François Tremblay, Martin Béland, Richard Gagnon, François Pomerleau, and Philippe Giguère. "Automatic 3D Mapping for Tree Diameter Measurements in Inventory Operations". In: *Journal of Field Robotics* (2020). Special issue: Field and Service Robotics 2019. DOI: https://doi.org/10.1002/rob.21980

Jean-François Tremblay and Martin Béland. "Towards operational marker-free registration of terrestrial lidar data in forests". In: *ISPRS Journal of Photogrammetry and Remote Sensing* 146 (2018), pp. 430–435. ISSN: 0924-2716. DOI: https://doi.org/10.1016/j.isprsjprs.2018.10.011. URL: http://www.sciencedirect.com/science/article/pii/S0924271618302892

REFEREED CONFERENCE PUBLICATIONS

Submitted: Jean-François Tremblay, Travis Manderson, Aurélio Noca, and Dave Meger. "Multimodal dynamics modeling for off-road autonomous vehicles". In: *Proceedings of IEEE International Conference on Robotics and Automation (ICRA)*. Xi'an, China, 2021

Travis Manderson, Juan Camilo Gamboa Higuera, Stefan Wapnick, Jean-François Tremblay, Florian Shkurti, Dave Meger, and Gregory Dudek. "Vision-based goal-conditioned policies for underwater navigation in the presence of obstacles". In: *Proceedings of Robotics: Science and Systems (RSS) XVI*. Corvallis, United-States, 2020. URL: https://arxiv.org/abs/2006.16235

Jean-François Tremblay, Martin Béland, François Pomerleau, Richard Gagnon, and Philippe Giguère. "Automatic 3D Mapping for Tree Diameter Measurements in Inventory Operations". In: *Proceedings of the 12th Conference on Field and Service Robotics (FSR)*. Springer. Tokyo, Japan, 2019. URL: https://arxiv.org/abs/1904.05281. **Invited to a special issue of the Journal of Field Robotics**

ACADEMIC EXPERIENCE

McGill University *September 2019 - Present*
Graduate student - Mobile robotics laboratory

- Robot programming with ROS (Python/C++)
- Research in reinforcement learning for robot navigation
- Machine learning programming in PyTorch, Tensorflow
- Member of McGill's Center for Intelligent Machines and Mila
- C++ – Python – PyTorch – ROS

Université Laval *September 2017 - August 2019*
Graduate student - Northern robotics laboratory

- Led and organized a project involving a forest technician and engineers
- Designed a field robotics experiment in forests

- Studied GPS-denied 3D mapping algorithms for mobile robots
- Studied tree diameter estimation methods from 3D points clouds
- A video of the 3D mapping results is available here
- C++ – Python – ROS

Université Laval *May 2019 - August 2019*
Graduate researcher - Digital forest laboratory

- Designed a wood-leaf lidar segmentation algorithm using machine learning
- Oversaw a team doing data labeling
- Helped other students in the lab researching deep learning for forest conservation efforts
- Python – TensorFlow – Keras – Scikit-Learn – Git

Université Laval *May 2016 - April 2017*
Undergraduate researcher - Digital forest laboratory

- Studied an algorithm for forest biomass prediction from 3D point clouds
- Designed an algorithm for point cloud registration of lidar data in forests
- Conducted an experimental validation of the registration algorithm
- MATLAB – C++ – Git

INDUSTRIAL EXPERIENCE

CRiQ (Québec's center for industrial research) *May 2018 - December 2018*
Mitacs intern, technology transfer

- C++ – Python – ROS

InnovMetric Software Inc. *May 2017 - August 2017*
C++ software developer, 3D scanning

- C++11 – Visual Studio – MFC – .NET – Mercurial – Continuous integration – Multithreaded code

CNESST (Québec government agency) *May 2015 - April 2016*
Software development intern, NoSQL databases

- Visual Basic (LotusScript) – Java – Requirement analysis – UI design

TALKS

Invited

- Jean-François Tremblay. "Automatic 3D Mapping for Tree Diameter Measurements in Inventory Operations". Presented at *NeurIPS Workshop on AI for Earth Sciences (AI4Earth), virtual*. 2020
- Jean-François Tremblay. "Automatic 3D Mapping for Tree Diameter Measurements in Inventory Operations". Presented at *Petit déjeuner FORAC*, Université Laval, Québec City. 2019
- Jean-François Tremblay. "Towards autonomous forest inventory with mobile robots". Presented at Québec's center for industrial research, Québec City. 2018

Refereed abstracts/Workshops

- *–Best paper award–, presented by Travis Manderson.* Travis Manderson, Juan Camilo Gamboa Higuera, Stefan Wapnick, Jean-François Tremblay, Hanqing Zhao, Florian Shkurti, Dave Meger, and Gregory Dudek. "Self-Supervised, Goal-Conditioned Policies for Navigation in Unstructured Environments". In: *Robotics: Science and Systems (RSS) Workshop of Self-Supervised Robot Learning*. Corvallis, United-States, 2020
- *Presented by Martin Béland.* Martin Béland and Jean-François Tremblay. "On separating wood from leaves, accounting for leaf angle distribution, and occlusion effects in terrestrial lidar scans of dense forests". Silvilaser. Iguazu Falls, Brazil, 2019
- Jean-François Tremblay. "An algorithm for marker-free registration of lidar point clouds in forests". 6ième édition de l'atelier T-Lidar pour la communauté francophone: Utilisation de nuage de points à haute densité pour l'écologie forestière. Sherbrooke, Canada, 2016

POSTERS

Jean-François Tremblay, David Meger “Learning latent dynamics from multi-sensor data”, presented at NCRN Annual General Meeting, 2020

Jean-François Tremblay, Martin Béland “Towards Operational Marker-Free Registration of Terrestrial Lidar Data in Forests”, presented at:

- Colloque REPARTI, Québec, Canada 2018
- NCFRN Annual General Meeting, Montréal, Canada, 2018
- *Presented by Martin Béland.* Royal Society Theo Murphy International Meeting: “The terrestrial laser scanning revolution in forest ecology”, Chicheley, United Kingdom, 2017

SCHOLARSHIPS, AWARDS

FRQNT Doctoral Scholarship, 84 000$	*May 2020 - August 2024*
Hydro-Québec Doctoral Fellowship, 15 000$	*October 2019 - August 2020*
Mitacs Accelerate, 30 000$	*May 2018 - December 2018*
McGill Grad Excellence Award, 4700$	*September 2019 - August 2020*

RELEVANT COURSES

Deep learning	Computer vision	Parallel and distributed computing
Mobile robotics	Optimization	Measure theory
Advanced probability I & II	Prob. graphical models	Reinforcement learning

REVIEWING

ISPRS Journal of Photogrammetry and Remote Sensing, one paper

NeurIPS 2020 AI for Earth Sciences Workshop, three papers

ICLR 2020 AI for Earth Sciences Workshop, two papers

IROS 2019 Workshop on Informed Scientific Sampling in Large-scale Outdoor Environments, two papers

EXTRA-CURRICULAR, VOLUNTEERING

Volunteer for the *Rendez-vous IA Québec 2019*

Member of the graduate program committee for Université Laval’s computer science department

Secretary-treasurer for the mathematics and statistics graduation committee of 2016-2017

Also participated in various fund raising activities for this graduation committee

Orange belt in Judo

Guitar player

TECHNICAL STRENGTHS

Computer Languages	C++, Python, MATLAB, Java
Software & Tools	Robot Operating System, NumPy, Scikit-Learn, Ceres, Eigen, PyTorch, Point Cloud Library, CMake, Linux

VARIA

Canadian citizen

Native French speaker

Fluent in English

Up to date as of November 6, 2020