

Jean-François Tremblay

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

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EDUCATION

McGill University

Ph.D., computer science

Mobile robotics - Neural state estimation - Reinforcement learning for robot control

Supervised by Professor David Meger

September 2019 - Present

Université Laval

Research M.Sc., computer science

Thesis: Forest inventory with lidar-equipped robot for difficult environments

Supervised by Professor Philippe Giguère and Professor Martin Béland

September 2017 - August 2019

GPA: 4.11/4.33

Université Laval

B.Sc., mathematics and computer science

September 2014 - May 2017

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* 37 (8 Dec. 2020). Special issue on Field and Service Robotics (FSR) 2019, pp. 1328–1346. 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

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. URL: <https://arxiv.org/abs/2011.11751>

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>

Invited to a special issue of the Journal of Field Robotics 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>.

REFEREED ABSTRACT/WORKSHOPS

Best paper award 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 on Self-Supervised Robot Learning*. Corvallis, United-States, 2020

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”. 6^{ième} 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

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

INVITED TALKS

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

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\$
Hydro-Québec Doctoral Fellowship, 15 000\$
Mitacs Accelerate, 30 000\$

May 2020 - August 2024
October 2019 - August 2020
May 2018 - December 2018

TEACHING EXPERIENCE

Université Laval

- Grader, MAT-1919: Mathematics for Computer Science *Winter 2019*

REVIEWING

IEEE International Conference on Robotics and Automation 2021, one paper

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

Orange belt in Judo

Guitar player

TECHNICAL STRENGTHS

Computer Languages Software & Tools

C++, Python, Julia, MATLAB, Java
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 March 3, 2021