

François-Michel De Rainville

Contact Information	Pavillon Adrien-Pouliot Université Laval PLT-1102-A Québec (Qc) G1V 0A6 Canada	<i>Phone</i> : (418) 656-2131 #4786 <i>Web</i> : http://vision.gel.ulaval.ca/~fmdrainville
Research Interests	Machine Learning, Computational Intelligence, Evolutionary Algorithms, Robotics, Virtual Reality	
Education	M.Sc., Electrical Engineering Laval University, Québec (Qc), Canada Fall 2010 <ul style="list-style-type: none">• Thesis Topic : Interactive Design of Experiments to Help Understand Complex Systems.• Supervisor : Professor Denis Laurendeau• Co-Supervisor : Professor Christian Gagné B.Ing., Computer Engineering Laval University, Québec (Qc), Canada Spring 2008 <ul style="list-style-type: none">• Computational intelligence specialization	
Journal Publications	F.-M. De Rainville, C. Gagné, O. Teytaud and D. Laurendeau, 2011. Evolutionary Optimization of Low-Discrepancy Sequences. <i>ACM Transactions on Modeling and Computer Simulations</i> . F.-M. De Rainville, F.-A. Fortin, M.-A. Gargner, M. Parizeau and C. Gagné, 2011. DEAP : Evolutionary Algorithms Made Easy. <i>Journal of Machine Learning Research</i> . Paper under review	
Conference Publications	F.-M. De Rainville, C. Gagné, O. Teytaud and D. Laurendeau, 2009. Optimizing Low-Discrepancy Sequences with an Evolutionary Algorithm. <i>Genetic and Evolutionary Computation Conference</i> , pp. 1491–1498. M. J.-D. Otis, C. du Tremblay, F.-M. De Rainville, M. Mokhtari, D. Laurendeau and C. M. Gosselin, 2008. Hybrid Control with Multi-Contact Interactions for 6DOF Haptic Foot Platform on a Cable-Driven Locomotion Interface. <i>16th Symposium on Haptic Interfaces for Virtual Environments and Teleoperator Systems</i> , pp. 161–168.	
Workshop Publications	F. Bernier, D. Laurendeau, F. Rioux, F.-M. De Rainville and M. Lizotte, 2010. IMAGE – Interactive Simulation to Increase Complex System Understanding. <i>NATO Modelling and Simulation Group Workshop</i> .	
Honors and Awards	Scholarship for Doctoral Studies, <i>Fonds de recherche du Québec - Nature et technologies</i> (Quebec Provincial Research Funding Agency), 2010. Best Paper Award, Real World Application Track of the <i>Genetic and Evolutionary Computation Conference</i> , for the paper <i>Optimizing Low-Discrepancy Sequences with an Evolutionary Algorithm</i> , 2009.	

Work Experience

Introduction to Design, Course Assistant

Laval University, Department of Electrical and Computer Engineering,
Québec (Qc), Canada Winter 2011

- Supported students with the organization of their term project.
- Elaborated students' final technical test.
- Corrected students' term projects.

Introduction to Python Programming, Course Assistant

Laval University, Department of Electrical and Computer Engineering,
Québec (Qc), Canada Fall 2010

- Helped students to learn the Python programming language.
- Supported students in the completion of their laboratories.
- Evaluated students' weekly homework.

Computer Engineer Consultant

Defence Research and Development Canada,
Valcartier (Qc), Canada Winter-Summer 2010

- Developed an exploration robot that transmits and projects a 3 dimensional representation of its environment.
- Software architect of the interface between the robot and the 3 dimensional view.
- Elaborated multiple data processing modules in the *Robot Operating System*.

Technical Support

CLUMEQ, Laval University, Québec (Qc), Canada Winter 2010

- Configured an error analysis service for the Colosse high performance computer.
- Maintained processing and file system hardware of the cluster.
- Installed and configured multiple scientific computing libraries under *Environment Modules*

Network Technician

Sun Microsystems, Québec (Qc), Canada Fall 2009

- Responsible for implementing a 360 InfiniBand cables network.
- Helped put into operation one of the top 100 supercomputers according to the Top500 Supercomputing Sites website.

Object Oriented Programming, Course Assistant

Laval University, Department of Electrical and Computer Engineering,
Québec (Qc), Canada Fall 2008-09

- Helped students to develop a virtual tennis game.
- Supported students in the completion their UML diagrams.
- Evaluated students' term projects.

Research Assistant

FOR@C Research Consortium, Québec (Qc), Canada Winter 2008

- Programmed an algorithm to simulate a wood finishing plant.
- Optimized an algorithm that managed wood arrivals in a wood processing plant.
- Tested software against unexpected inputs.

Virtual Reality Research Assistant

Defence Research and Development Canada,
Valcartier (Qc), Canada Summer – Fall 2007

- Developed a virtual reality training software.
- Integrated tools to help the manipulation of objects in a virtual world.
- Produced realistic objects using Autodesk's 3ds Max software.

Research Assistant

NELI Project, Laval University, Québec (Qc), Canada Summer 2007

- Refined communication protocol of the haptic module.
- Improved the collision system in order to render them more realistic.

Other Experience	Free Software Developer	
	DEAP (Python)	2009 – 2011
	<ul style="list-style-type: none"> • Founder of the Evolutionary Algorithm in Python (EAP) framework. • Participated in the elaboration of the distribution module of DEAP a Distributed Evolutionary Algorithm in Python. 	
	Open BEAGLE (C++)	2009 – 2010
	<ul style="list-style-type: none"> • Developed an OpenMP optimization for the crossover, mutation, evaluation and selection operators • Added mutation and crossover operators for vector of indices representation. • Corrected numerous low level bugs in the framework. 	
	Java Developer	
	Multichronia	2008 – 2009
	<ul style="list-style-type: none"> • Added design of experiments tools in the framework. • Modified the simulation modules so that simulations can be conducted in parallel. • Collaborated in numerous bug detections. 	
Social Commitments	Volunteer	
	Relay for Life	Summer 2008 – 2011
	Special Olympics National Winter Games 2008	Winter 2008
	Computer Engineering Competition Director	
	Engineering Games 2010	Fall 2010
	<ul style="list-style-type: none"> • Organizer of the academic and practical computer science competition. 	
Technical Skills	Programming : C++, Python, Java, C#, CVS, SVN, SQL, HTML and others.	
	Programming Techniques : Evolutionary Algorithms, Neural Networks, Classifier Systems, Multiagent Systems, Multitask programming (OpenMP , OpenMPI , pthread), GPU Programming	
	MATLAB : Image Processing, Optimization, Neural Network, Genetic Algorithms, Regression	
	Applications : $\text{T}_{\text{E}}\text{X}$, $\text{L}^{\text{A}}\text{T}_{\text{E}}\text{X}$, $\text{BIB}\text{T}_{\text{E}}\text{X}$, Microsoft Office, iWork, Microsoft Visual Studio, Xcode, Eclipse, NetBeans, CMake, 3ds Max	
	Operating Systems : Microsoft Windows XP/2000/Vista, Apple OS X, Linux (Fedora Core, Ubuntu, CentOS)	
	Low-discrepancy sequences, Optimization, Design of experiment	
Languages	Fluent in French and English, oral and written	