CARL LEMAIRE

github.com/LemaireCarl
Sherbrooke, Québec, Canada
carl.lemaire@usherbrooke.ca

EDUCATION

Université de Sherbrooke   *January 2017 - December 2018*
Master's in Computer Science — Advisor : Pierre-Marc Jodoin
Subject : Sparsification of Deep Neural Networks
Deep Learning, Computer Vision, Bayesian Statistics
2 internships at Miovision, inc (Kitchener, Ontario) ; 20 000$ in Mitacs grants

Université de Sherbrooke   *August 2013 - December 2016*
Bachelor's degree in Comp. Sci. (Sciences de l'image et des médias numériques)   Score : 3,93 / 4,3
Computer Vision ; Machine Learning ; CGI ; DSP ; Software Design ; Statistics ; Calculus.

WORK EXPERIENCE

Université de Sherbrooke, Sherbrooke   January 2019 – Today
Analyst, Machine Learning and High Performance Computing
Compute Canada staff
· Design and implement machine learning models and pipelines for researchers in a range of fields
· Design and implement tools and processes for the efficient development of machine learning solutions
· Help researchers run machine learning experiments efficiently on Compute Canada clusters
· Help maintain Compute Canada's high performance computing environment

Metareal, Montréal   May 2016 – August 2016
Computer Vision Researcher (Intern)
· Spherical image processing, pattern recognition (OpenCV, C++)
· Synthesis and Tone Mapping of HDR Imagery

Autodesk, Montréal   3 interships, 10 months total   May 2014 – December 2015
Software Developer (Intern)
· Implement and maintain a custom framework for unit test and integration tests (C#)
· Implement user interface components

PUBLICATIONS

Carl Lemaire, Andrew Achkar, Pierre-Marc Jodoin. « Structured Pruning of Neural Network with Budget-Aware Regularization ». Published in IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2019, pp. 9108-9116.

Zhiming Luo, Frédéric B.-Charron, **Carl Lemaire**, Janusz Konrad, Shaozi Li, Akshaya Mishra, Andrew Achkar, Justin Eichel, Pierre-Marc Jodoin. « MIO-TCD : A new benchmark dataset for vehicle classification and localization ». Published in IEEE Transactions on Image Processing, vol. 27, no. 10, pp. 5129-5141, Oct. 2018.

PROJECTS

Pruning of Deep Neural Networks
January 2017 - December 2018
Master's thesis project

· Perform a literature review of : compression, design, acceleration and optimization of neural networks ; with a focus on convolutional neural networks.
· Implement methods from the literature about the pruning of convolutional neural networks
· Design and evaluate new methods for reducing the resource consumption of neural networks while retaining satisfying accuracy.
· Co-write and submit a paper accepted to CVPR.

Antigen-Antibody Affinity Analysis
January 2019 - Today
Machine Learning Consultancy

· Design and implement a model and pipeline for recognizing paratopes in amino-acid chains. Code available online : `github.com/lemairecarl/paratope-pred`
· Research into new models and approaches to antigen-antibody affinity analysis and discovery.

HyperTrainer : Experiment Manager and Dashboard
February 2019 - Today
Support to the Compute Canada machine learning community

· Implement a system for launching machine learning experiments on various hardware, such as clusters, cloud compute, or a local computer.
· Implement a web-based user interface for managing and monitoring these experiments.
· Code available online : `github.com/lemairecarl/hypertrainer`

Benchmark on Vehicle Classification and Localization
January 2017 - July 2017
As part of my master's

· Implement 6 convolutional network architectures from the recent literature (AlexNet, VGG, Inception-V3, ResNet, Xception, DenseNet).
· Evaluate the performance of these architectures on the MIO-TCD dataset from Miovision, inc.
· Participate in writing a paper published in IEEE Transactions on Image Processing.

SKILLS

Programming	Python, C++, C#, Javascript, LaTeX
Tools	PyTorch, Tensorflow, Keras, scikit-learn, NumPy, OpenCV, OpenGL
Communication	Scientific Writing, Scientific Popularization

ACHIEVEMENTS

Scholarships. I obtained a 17,500$ scholarship from FQRNT. I received a 1,000$ entry scholarship from the Université de Sherbrooke for past academic excellence.

Involvement and Volunteering. I was president of my class during my bachelor's. I have been member of the administrative council of our students association. I made more than ten blood donations.

Scientific Popularization. I have made oral presentations about machine learning to various audiences. I introduced various subjects, including : neural networks, generative adversarial networks, biases in word vectors, Deep Fakes, neural network sparsification.