

# Gabriel Huang

Website : <https://gabrielhuang.github.io>  
Github : <https://www.github.com/gabrielhuang>

gbxhuang@gmail.com  
(+1) 438-924-4894  
Montreal, Quebec, Canada

## SUMMARY

**PhD candidate in machine learning.**

*Some topics of interest: few-shot & meta-learning, semi-supervised, self-supervised and weakly-supervised learning, natural language processing applications, multi-object tracking, instance-level segmentation, dense video captioning, video segmentation, autonomous driving, SLAM, multimodal aspects, music generation, interpretable systems.*

## EDUCATION

**Mila, University of Montreal, Quebec, Canada. 2017-2022 (Expected)**  
*PhD Candidate in Machine Learning, advised by Simon Lacoste-Julien.*  
**Best scores at qualifying exams on deep learning. GPA: 4.3/4**

**Ecole Normale Supérieure, Université Paris-Saclay, France. 2015-2016**  
*MSc. Machine Learning, Computer Vision and Applied Mathematics (MVA).*  
*The class is composed of the best French students in the field, coming from the leading "Grandes Ecoles" (Ecole Normale Supérieure, Ecole Polytechnique, CentraleSupélec, les Mines, etc.). These French schools perform a very strong selection of students based on mathematical skills, and provide thorough training.*

**CentraleSupélec Engineering School, Paris, France. 2013-2016**  
*Engineer's degree, Applied Mathematics and Statistics*  
**Best academic results of class of 2016, out of 200 students.**  
*About the school: CentraleSupélec is commonly recognized as one of the top-3 engineering schools in France. I followed a multidisciplinary curriculum in Mathematics, Physics and Computer Science, with a specific focus on Machine Learning during the third year.*

## AWARDS

- Winner of the 2017 McGill ImplementAI Hackathon, by developping an *AirGuitar* which can be virtually controlled using pose-estimation from RGB video.
- Winner of the 2014 Dassault Aviation UAV Challenge, after building and programming an autonomous hexacopter to detect, track and drop packages on visual targets using a RGB camera (team of 4).
- Winner of the 2014 Startup WeekEnd Polytechnique Jury's Prize by developing a low-cost eye tracker for an orthoptics spinoff from Université Pierre et Marie Curie (SAVANT)

## TECHNICAL SKILLS

**Programming :** Python, C++, CUDA

**Deep Learning :** PyTorch, Tensorflow, OpenCV

**Familiar with :** Multimodal Transformers, Meta-learning models, Generative Adversarial Networks, Kalman filters, particle filters, stereo vision, Mask R-CNN. Experience with processing large video datasets (>10 Terabytes).

**Hardware:** Worked with real-time RGB and Kinect video feeds, Arduino UAV.

<b>EXPERIENCE</b>	<b>Element AI</b> , Montreal, QC, Canada. <b>Fall 2020 (Expected)</b> <i>Research Intern in Computer Vision Team.</i> <ul style="list-style-type: none"> <li>• Develop methods for few-shot semantic segmentation and instance segmentation.</li> <li>• Planned submission to computer vision conference.</li> </ul>
	<b>Google</b> , Mountain View, CA, USA. <b>Fall 2019</b> <i>Research Intern in GARCON Team</i> <ul style="list-style-type: none"> <li>• Investigated multimodal captioning of YouTube instructional videos using video features and automated speech recognition.</li> <li>• Explored several self-supervised pretraining strategies for sequence-to-sequence transformer. Beat SOTA on YouCook II dense captioning task.</li> <li>• Used several text-only and multimodal pretraining and parallel sources such as HowTo-100M, Youtube-8M, Wikihow, Recipe-1M, YouCook II.</li> </ul>
	<b>Patterns Technologies</b> , Montreal, Quebec, Canada. <b>2017-2018</b> <i>Chief Data Scientist and Co-founder</i> <ul style="list-style-type: none"> <li>• Developed and deployed a webservice for age and gender prediction.</li> <li>• Research on automated summary generation from on-site user reviews.</li> </ul>
	<b>Cardabel</b> , Inappropriate Trading Detection, Paris, France. <b>Fall 2016</b> <i>Machine Learning Consultant</i> <ul style="list-style-type: none"> <li>• Set-up Apache Spark infrastructure, train employees, write documentation.</li> <li>• Ported anomaly detection algorithms from C# to PySpark.</li> </ul>
	<b>Dassault Systèmes</b> , Paris, France. <b>2013-2016</b> <i>Research Intern, two days per week in parallel with MSc.</i> <ul style="list-style-type: none"> <li>• Research on Human Activity recognition with a Kinect.</li> <li>• Research on Content recommendations for internal social network.</li> <li>• Implemented and parallelized supervised and unsupervised machine learning algorithms in C++ and CUDA.</li> </ul>
	<b>Princeton University</b> , New Jersey, USA. <b>Spring 2015</b> <i>Exchange student.</i> <i>Took graduate classes in Computer Vision, Deep Learning, and Machine Translation.</i> <b>GPA: 3.675/4</b>
<b>RELEVANT COURSES</b>	<ul style="list-style-type: none"> <li>• Structured Prediction(Simon Lacoste-Julien)</li> <li>• Theoretical Machine Learning (Ioannis Mitliagkas)</li> <li>• Probabilistic Graphical Models (F. Bach, G. Obozinski, S. Lacoste-Julien)</li> <li>• Signal Processing, Wavelets, and Compressed Sensing (2 classes: S. Mallat, G. Peyre)</li> <li>• Statistical Learning (2 classes: N. Vayatis, E. Hazan)</li> <li>• Deep Learning and Computer Vision (3 classes: I. Kokkinos, S. Seung, J. Xiao)</li> <li>• Convex Optimization (A. Aspremont)</li> <li>• Natural Language Processing (S. Bangalore, M. Vazirgiannis)</li> </ul>
<b>TEACHING EXPERIENCE</b>	<b>Graduate class on Probabilistic Graphical Models</b> by Simon Lacoste-Julien. <i>Teaching Assistant.</i> <ul style="list-style-type: none"> <li>• Graded homework and final projects</li> <li>• Gave lecture on Dirichlet processes and Gaussian processes.</li> </ul>

**REFEREED  
CONFERENCE  
AND JOURNAL  
PUBLICATIONS**

**Multimodal Pretraining for Instructional Video Captioning**  
**Gabriel Huang**, Bo Pang, Zhenhai Zhu, Clara Rivera, Radu Soricut.  
*AAACL-IJCNLP 2020*.  
[arxiv] [data] [video] [slides]

**Scattering Networks for Hybrid Representation Learning**  
Edouard Oyallon, Sergey Zagoruyko, **Gabriel Huang**, Nikos Komodakis, Simon Lacoste-Julien, Matthew Blaschko, Eugene Belilovsky.  
*IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI)*  
[paper]

**Negative Momentum for Improved Game Dynamics**  
Gauthier Gidel, Reyhane Askari Hemmat, Mohammad Pezeshki, **Gabriel Huang**, Rémi Lepriol, Simon Lacoste-Julien, Ioannis Mitliagkas.  
*AISTATS 2019*  
[arxiv]

**PREPRINTS  
AND  
TECHNICAL  
REPORTS**

**Are Few-Shot Learning Benchmarks too Simple ? Solving them without Test-time Labels**  
**Gabriel Huang**, Hugo Larochelle, Simon Lacoste-Julien.  
*Technical Report*.  
[arxiv] [code] [shortscience]

**Parametric Adversarial Divergences are Good Task Losses for Generative Modeling**  
**Gabriel Huang**, Hugo Berard, Ahmed Touati, Gauthier Gidel, Pascal Vincent, Simon Lacoste-Julien.  
*Planned submission to JMLR*.  
[arxiv]

**ADDITIONAL  
ACTIVITIES**

- Likes to do acroyoga, rock-climbing and paragliding.
- Electronic music production with Ableton Live. Soundcloud: Poivre Noir.