EMMANUEL BENGIO
folinoid.com

Education

PhD in Computer Science — MCGILL UNIVERSITY, 2016-2022
Thesis: Generalization, optimization, diverse generation: insights and advances in the use of bootstrapping in deep neural networks
Advisors: Joelle Pineau & Doina Precup

Master's in Computer Science — MCGILL UNIVERSITY, 2014-2016
Thesis: On Reinforcement Learning for Deep Neural Architectures : Conditional Computation with Stochastic Computation Policies
Advisors: Joelle Pineau & Doina Precup

Bachelor's in Computer Science, honor — UNIVERSITÉ DE MONTRÉAL, 2011-2014

Diploma of College Studies (**DEC**) in Comp. Sci. and Maths — CÉGEP DE BOIS-DE-BOULOGNE, 2009-2011

Selected Scientific works - see my Google Scholar page for a complete list

Flow Network based Generative Models for Non-Iterative Diverse Candidate Generation. Emmanuel Bengio, Moksh Jain, Maksym Korablyov, Doina Precup, Yoshua Bengio (NeurIPS, 2021)

Interference and Generalization in Temporal Difference Learning. Emmanuel Bengio, Joelle Pineau, Doina Precup (ICML 2020)

A Closer Look at Memorization in Deep Networks. Devansh Arpit, Stanisław Jastrzębski, Nicolas Ballas, David Krueger, Emmanuel Bengio, Maxinder S. Kanwal, Tegan Maharaj, Asja Fischer, Aaron Courville, Yoshua Bengio, Simon Lacoste-Julien (ICML 2017, NVIDIA Pioneering Research Award)

Independently Controllable Features. Emmanuel Bengio, Valentin Thomas, Joelle Pineau, Doina Precup, Yoshua Bengio (RLDM 2017)

Conditional Computation in Neural Networks for faster models. Emmanuel Bengio, Pierre-Luc Bacon, Joelle Pineau, Doina Precup. Workshop Track (ICLR 2016)

Combining Modality Specific Deep Neural Networks for Emotion Recognition in Video, S. Ebrahimi et al., Emotion Recognition In The Wild Challenge and Workshop (EmotiW 2013)

Work Experience

Senior Machine Learning Scientist — RECURSION PHARMACEUTICALS, 2022-

Research Internship, Deepmind Montreal team — DEEPMIND, 2019

Research Internship, Google Brain Montreal team — GOOGLE, 2018

Technical Skills - my github profile

Language of choice: Python - Capable with: C, C++, Javascript, Java, LaTeX
Used on occasion: Scheme, x86, SQL, GLSL, CUDA, EmacsLisp

Technologies of choice: PyTorch, Theano, pyplot, Linux
Familiar with: slurm/PBS-style scheduling, sqlite, SFML, WebGL

Comfortable with calculus, probability and statistics, linear algebra, graph theory, machine learning and deep learning theory.

Scientific Activities

I have reviewed for:

- ICLR, International Conference on Learning Representations (2017-)
- ICML, International Conference on Machine Learning (2017-)
- NeurIPS, Neural Information Processing Systems (2017-)
- AAAI, Association for the Advancement of Artificial Intelligence (2020-)
- MAIS, Montreal AI Symposium (2019-)
- JMLR, the Journal of Machine Learning Research

I was a Teaching Assistant at McGill University for:

- Artificial Intelligence, COMP-424, Winter 2016
- Applied Machine Learning, COMP-551, Fall 2016 & Winter 2017

I was a mentor in the AI4Good Lab in 2018, and I actively maintained reading groups and discussion groups within Mila.

Distinctions & Scholarships

FRQNT Doctoral Research Scholarship - *Fonds de Recherche du Québec Nature et Technologies* 2017-2020
NSERC Canada Graduate Scholarship - Master's Program 2014-2015
Palmarès du Doyen de la Faculté des Arts et Sciences (academic excellence distinction) 2012, 2013, 2014
NSERC Undergraduate Student Research Awards Summer 2013
Bourse d'excellence académique Abilis, Solutions Abilis (academic excellence scholarship) 2013
Entry scholarship, Département d'Informatique et Recherche Opérationelle (acad. excellence) 2011-2014

Roles in Student Societies

Association générale des étudiants de Bois-de-Boulogne (AGEBdeB)
Coordinator of the *Coda*, the school's music comitee BOIS-DE-BOULOGNE 2009-2011

Association des étudiants du Département d'informatique et de recherche opérationelle de l'Université de Montréal (AÉDIROUM)
2nd, then 3rd year student representative UNIVERSITÉ DE MONTRÉAL 2012-2014

Interests

Machine Learning, deep learning and reinforcement learning. In particular, using RL methods to extend deep models, unsupervised learning in RL environments, and applying RL to real-world problems.

Compilers, design and implementation of programming languages.
Music, guitar improvisation and composition.

About me

I am currently a Senior ML Scientist at Recursion, doing research on generaive models of drug molecules, and freshy out of a PhD at McGill University, where I was doing research on Deep RL.

For me research is a very motivating way to spend time. Trying to understand how stuff works and pushing the boundaries of knowledge (either mine, or better, humanity's) have kept me awake at night since I was a kid.

My journey with deep learning began around 2010, where I played with sparse coding and emotion recognition, followed by real-time 3D illumination with sparse mixtures, RBF-like autoencoder representations, lexer optimization, and attempts to replicate early DQN results. I then turned Deep-RL into RL-Deep by using RL to perform lazy evaluation of deep nets (and write a master's thesis). Then, for a while I investigated "unsupervised" deep RL, that is, learning representations through interaction with an environment using deep models. I then turned my attention to understanding more fundamental mechanisms of generalization and optimization in value-based Deep RL.

I am now mostly interested in applying RL to real world problems like drug discovery.

I'm also a decent guitar player and I enjoy cycling! I love musical improv, and have composed a few things.