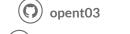




514-629-5658





### education

### bsc | h. prob & stats, min cs mcgill university | 2018-2021

- interests: reinforcement learning, learning theory, optimal transport, consciousness, intelligence
- expected year of graduation: 2021

## teaching

# mcgill - society of undergrad math students winter 2021

• co-instructor, basic reinforcement learning: elementary theory and applications

#### université de montréal fall 2020

 teaching assistant, foundations of machine learning (3395/6390), prof. Rabusseau, prof. Mitliagkas

### grad courses

#### math

advanced real analysis functional analysis advanced probability regression and anova topics: concentration phenomena

#### CS

machine learning topics: maths of machine learning topics: stat. learning theory

### skills

#### langs

experienced
python • java • C • bash
proficient
UNIX • R • OCaml • MATLAB

#### ml/ai

frameworks, libraries
pytorch • gym • bsuite • tensorflow • scikit-learn

keras • opencv • pandas • numpy platforms

slurm • gcp • aws • watson • dialogflow



### research

#### mcgill - prof. doina precup | research

summer 2020 - present

- researched with prof. Precup on deep exploration in reinforcement learning, in particular, provably-efficient information-directed sampling for linear MDPs, deriving high-probability regret bounds
- develop and maintain a deep reinforcement learning api written in pytorch for quick and easy algorithm prototyping, testing, and interpretation

# mcgill - prof. abbas khalili | research project winter 2020

- researched with prof. Khalili on the behavior of neural networks under gradient descent from the perspective of gradient flow in the space of measures w/ the Kantorovich (Wasserstein) metric, in particular the landscape geometry of the optimization objective
- employed various concentration inequalities, functional analysis, and propagation
  of chaos type arguments to prove convergence of stochastic gradient descent to a
  limiting PDE

# inrs - prof. long le - necphylab | research summer-fall 2019

- researched with prof. Le in his CSI project, built, reproduced, and improved frontier models in domain-independent joint activity/localization using channel-state information from WIFI Tx/Rx
- **proposed** and explored deep regressive models to build a novel continuous human localization algorithm in a controlled setting
- applied various image processing algorithms, including CMU's Openpose, to produce labeled data for localization regression
- applied signal processing, time series analysis for data understanding, feature engineering, feature selection, and dimensionality reduction

## projects, experiences

# mcgill - prof. prakash panangaden | term paper, presentation fall 2019

- researched continuous neural networks: formulation and equivalence to regular neural networks
- studied convergence to Gaussian processes in the infinite width limit, gradient flow in function space w.r.t. the Neural Tangent Kernel (NTK), and universal approximation of operators and functionals by function machines
- proved universal approximation of functional continuous neural networks
- delivered presentation at the Seminary on Undergraduate Mathematics in Montreal (SUMM)

# self-driving wheelchair | neurotechx 2019 - mcgill | ml team winter 2019

- researched state-of-the-art models and feature construction pipelines in classification of motor imagery signals
- used numpy, scipy, matplotlib, seaborn for the analysis and interpretation of EEG time series signals and spectrograms of frequency distributions over time
- re-implemented milestone works from the literature in PyTorch, ran benchmarks on different EEG datasets, both simulated and real
- placed First in the NeurotechX Competition, 2019