Viet Nguyen

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EDUCATION

McGill University
Master of Science, Computer Science

2021 – 2022
Montreal, QC

- **Interests:** reinforcement learning, learning theory, continual learning, consciousness, intelligence.
- Start date: May 2021

McGill University
Bachelor of Science, Honors Probability and Statistics, Minors Computer Science

2018 – 2021
Montreal, QC

RESEARCH

Mila, McGill University, prof. Doina Precup
Research Assistant

Spring 2020 – present
Montreal, QC

- Researched on deep exploration in reinforcement learning.
- Contributions include experimental results and high-probability regret bounds for novel posterior sampling-based algorithms.
- Developed and maintained a deep reinforcement learning api written in pytorch for quick and easy algorithm prototyping, testing, and interpretation.

McGill University, prof. Abbas Khalili
Research Student

Winter 2020
Montreal, QC

- Researched the landscape geometry of the neural network optimization objective from the perspective of gradient flow in the space of probability measures endowed with the Kantorovich metric.
- Employed various concentration inequalities, functional analysis, and propagation of chaos type arguments to prove convergence of stochastic gradient descent to a limiting PDE.

NeCPhyLab - INRS, prof. Long Le
Research Assistant

Summer 2019
Montreal, QC

- Contributed to the CSI project: built, reproduced, and improved frontier models in domain-independent joint activity/localization using channel-state information from WIFI Tx/Rx.
- Propose and explored deep regressive models to build a novel continuous human localization algorithm in a controlled setting.

SELECTED EXPERIENCES

McGill University, prof. Prakash Panangaden
Term Project

Fall 2019
Montreal, QC

- 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).**

McGill NeurotechX 2019, ML team
Self-Driving Wheelchair

Winter 2019
Montreal, QC

- Researched state-of-the-art models and feature construction pipelines in classification of motorimagery signals.
- Used numpy, scipy, matplotlib, seaborn forthe 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.**

PUBLICATIONS

- Ishfaq, H., Yang, Z., Lupu, A., **Nguyen, V.**, Liu, M., Islam, R. Precup, D., Wang, Z. *Provably Efficient Policy Optimization via Thompson Sampling.* Deep Reinforcement Learning Workshop at NeurIPS 2020, BayLearn 2020 Workshop.

Other works and presentations

- **Nguyen, V.**, Hu, E. *Value Iteration-based Provably Efficient Exploration.* January, 2021
- Hu, E., **Nguyen, V.** *Provable Efficiency: Finding Regret Bounds in Reinforcement Learning.* December, 2020
- **Nguyen, V.** *On the Analysis of Stochastic Gradient Descent in Neural Networks via Gradient Flows.* May, 2020
- **Nguyen, V.**, *On the Concentration of Measure in Orlicz spaces of exponential type.* April, 2020
- Hu, E., Huang, L., **Nguyen, V.** *Neural Networks: A Continuum of Potential.* December, 2019
- Zelaya, M.C., Leech, M., **Nguyen, V.** *Fader Networks: A Heuristic Approach.* April, 2019

Teaching

Basic Reinforcement Learning, SUMS, McGill University | *Co-Instructor*	Winter 2021
Foundations of Machine Learning, University of Montreal | *Teaching Assistant*	Fall 2020, Winter 2021

Skills

- **Toolkit and platforms:** python, java, C, bash, UNIX, R, OCaml, MATLAB; slurm, GCP, AWS, Watson, Dialogflow
- **MLAI frameworks/libraries:** pytorch, gym, bsuite, tensorflow, opencv, scikit-learn

Graduate Coursework

Advanced Real Analysis

Functional Analysis

Advanced Probability Theory

Regression, ANOVA

Generalized Linear Models

Sampling Theory, Applications

Machine Learning

General Relativity

Topics: Concentration Phenomena

Topics: Mathematical Techniques for Machine Learning

Topics: Statistical Learning Theory