

Flemming Kondrup

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RESEARCH INTERESTS

- Enhancing the safety, reasoning, and sample efficiency of autonomous Agents in complex environments by integrating LLMs and VLMs, with a focus on robust decision-making and generalization in web-based settings.
- Developing agentic systems for healthcare that prioritize safety, robustness under uncertainty, and efficient learning in data-constrained environments, with a focus on reliable decision-making and real-world applicability.

EDUCATION

PhD in Quantitative Life Science, Mila & McGill University, 4.00/4.00 2022-current

Supervisory: Dr. Doina Precup

Advisory: Dr. Joelle Pineau, Dr. Lars Grant

Bachelor of Science, McGill University, 3.77/4.00 2018-2022

First-Class Honours Distinction in Biological, Biomedical and Life Science Program

WORK EXPERIENCE

Dialogue, Montreal, Canada January – April 2025

Machine Learning Intern (mentor: Alexis Smirnov)

- Led the successful deployment of Generative Vision-Language Models (VLMs) in production to automate patient photo verification for telemedicine, boosting classification accuracy by 17% and streamlining the intake process.
- Developed an LLM-powered symptom intake system, reducing patient input time, improving member experience and streamlining the matching process with healthcare professionals.

RESEARCH EXPERIENCE

Royal Victoria Hospital, MUHC, Montreal, Canada May – August 2021

Research Intern (mentor: Peter Metrakos)

- Leveraged immune cell computational analyses to uncover immunotherapy targets in intrahepatic cholangiocarcinoma, driving innovation in liver cancer treatment strategies.

McGill University, Dept. of Biomedical Engineering, Montreal, Canada Feb – May 2021

Research Intern (mentor: David Junker)

- Developed and applied nanotechnology-driven microfluidic platforms for high-throughput isolation of circulating tumor cells, integrating computational analysis to identify key diagnostic and prognostic biomarkers.

Royal Victoria Hospital, MUHC, Montreal, Canada Sept 2020 – April 2021

Research Intern (mentor: Peter Metrakos)

- Performed immunohistochemical profiling of Hepatocellular Carcinoma to identify cellular markers and elucidate tumor microenvironment dynamics.

AWARDS

Fonds de Recherche du Québec (FRQ) - Doctoral \$100,000 CAD

Fonds de Recherche du Québec (FRQ) - Masters \$40,000 CAD

Winner of the 2021 ProjectX Artificial Intelligence Competition – Clinical Practice Cohort \$25,000 CAD

McGill Quantitative Life Science Stipend Award \$21,000 CAD

Mitacs Accelerate Scholarship (Winter 2025) \$15,000 CAD

Recipient of the Schull-Yang International Experience Award Scholarship \$7,000 CAD

1st place, McGill Quantitative Life Science 3MT Summer Competition 2023-24

1st place, McGill Quantitative Life Science 3MT Winter Competition 2023-24

Dean's Multidisciplinary Undergraduate Research List Distinction

NOTABLE COURSEWORK

McGill: Applied Machine Learning (COMP551, 4.0/4.0), Data Science (COMP598, 4.0/4.0), Reinforcement Learning (COMP579, 4.0/4.0), Foundations of Quantitative Life Sciences (QLSC600, 4.0/4.0), AI in Medicine (EXSU500, *in progress*)

Mila: Representation Learning (IFT6135, 4.0/4.0), Towards AGI: Scaling, Alignment and Emergent Behaviors (IFT6760A, *audited*)

PUBLICATIONS

Journal Publications

Transferrable Model-Based Reinforcement Learning for Personalized Insulin Therapy

<u>Flemming Kondrup*</u> , S. Basu*, Adriana Romero-Soriano, D. Precup	Submitted
Machine learning outperforms the Canadian Triage and Acuity Scale in predicting need for early critical care L. Grant, M. Diagne, R. Aroutiunian, D. Hopkins, T. Bai, <u>Flemming Kondrup</u> , G. Clark	Canadian Journal of Emergency Medicine
The Deep Fascia and its Role in Chronic Pain and Pathological Conditions <u>Flemming Kondrup</u> , Nathaly Gaudreault, Gabriel Venne	Clinical Anatomy
Characterizing the interplay between angiogenic and immunoreactive factors of Hepatocellular Carcinoma A. Kapelanski-Lamoureux, A. Lazaris, <u>Flemming Kondrup</u> , T. Mayer, S. K. Petrillo, L. Krzywon, P. Metrakos	Submitted
<u>Conference Publications</u>	
Cracking the Code of Action: A Generative Approach to Affordances for Reinforcement Learning L. Cherif*, <u>Flemming Kondrup*</u> , D. Venuto, A. Anand, K. Khetarpal, D. Precup	Submitted
Towards Safe Mechanical Ventilation Treatment Using Deep Offline Reinforcement Learning <u>Flemming Kondrup*</u> , T. Jiralerspong*, E. Lau*, N. de Lara, J. Shkrob, M.D. Tran, D. Precup, S. Basu	AAAI 2023
<u>Conference Abstracts & Workshops</u>	
Cracking the Code of Action: A Generative Approach to Affordances for Reinforcement Learning L. Cherif, <u>Flemming Kondrup*</u> , D. Venuto, A. Anand, K. Khetarpal, D. Precup	ICLR 2025
Forecaster: Towards Temporally Abstract Tree-Search Planning from Pixels <u>Flemming Kondrup*</u> , T. Jiralerspong*, D. Precup, K. Khetarpal	NeurIPS 2023
Deep Conservative Reinforcement Learning for Personalization of Mechanical Ventilation Treatment <u>Flemming Kondrup</u> , T. Jiralerspong, E. Lau, N. de Lara, J. Shkrob, M.D. Tran, D. Precup, S. Basu	RLDM 2022
The implication of Deep Fascia in chronic pain and common MSK-related pathological conditions <u>Flemming Kondrup</u> , Nathaly Gaudreault, Gabriel Venne	Fascia Research Congress 2022
Characterizing the Interplay between Angiogenic and Immunoactive Factors of Hepatocellular Carcinoma A. Kapelanski-Lamoureux, <u>Flemming Kondrup</u> , L. Krzywon, S. Petrillo, A. Lazaris, P. Metrakos	Canadian Liver Meeting 2022
Personalizing Mechanical Ventilation using Deep Conservative Reinforcement Learning <u>Flemming Kondrup</u> , Elaine Lau, Thomas Jiralerspong, Jacob Shkrob, My Duc Tran, Nathan de Lara, Sumana Basu	UofT A.I. Conference 2022
Hepatitis as a predictor of CD4+ Cell Infiltration in Hepatocellular Carcinoma tumors <u>Flemming Kondrup</u> , Audrey Kapelanski-Lamoureux, Stephanie Petrillo, Anthoula Lazaris, Peter Metrakos	MUHC Cancer Research 2022
Characterizing the Interplay between Angiogenic and Immunoactive Factors of Hepatocellular Carcinoma A. Kapelanski-Lamoureux, <u>Flemming Kondrup</u> , S. Petrillo, T. Mayer, A. Lazaris, P. Metrakos	Canadian Liver Meeting 2021
LEADERSHIP & VOLUNTEERING	
Executive Director of the McGill Student Emergency Response Team (MSERT)	March 2023 – April 2024
<ul style="list-style-type: none"> Led a 70+ member emergency response team, managed a \$100K+ CAD annual budget, and acted as the primary liaison with McGill administration and government agencies. 	
Training Coordinator of the McGill Student Emergency Response Team (MSERT)	March 2022 – April 2023
<ul style="list-style-type: none"> Designed and led medical emergency response training programs, evaluations, and mentorship. 	
Emergency Medical Responder of the McGill Student Emergency Response Team (MSERT)	Sept. 2019 – August 2025
<ul style="list-style-type: none"> Delivered 2,000+ hours of emergency medical care as a certified first responder. 	
Team Captain of the McGill Team in the 2021 ProjectX AI Competition	Sept 2021 – Feb 2022
<ul style="list-style-type: none"> Led a 6-member team against 20+ teams across North America, achieving first place with a \$25,000 award. 	
INVITED TALKS & MEDIA	
“Six McGill undergrads win UofT international artificial intelligence competition” The McGill Tribune	
“Applying Reinforcement Learning to improve Healthcare” McGill AI Club Learnathon 2022	
“Undergrad team uses machine learning to create a better hospital ventilator” McGill Reporter	
“The implication of the Deep Fascia in Chronic Pain and Pathological Conditions” University of Padova	