

# FRANCIS CARTER

Neuroscientist,  
Machine Learner,  
and Wrestler

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## Languages

English ● ● ● ● ●  
French (native) ● ● ● ● ●

## Programming

*Scientific*  
Python ● ● ● ● ●  
R ● ● ● ● ●  
MatLab ● ● ● ● ●  
*Backend*  
Java ● ● ● ● ●  
Python (Django) ● ● ● ● ●  
*Frontend*  
HTML, CSS ● ● ● ● ●  
Javascript ● ● ● ● ●

*Other relevant experience:*  
PyTorch, TensorFlow, Scikit-Learn,  
Keras, Multiprocessing.  
Linux, Bash programming, git, ssh  
protocol, Mac, Windows.  
Google cloud computing, SQL.

## Certifications

- 2018, Workplace Safety  
WHIMIS
- 2018, Animal Care Training  
for research
- 2017, CPR/AED Training  
YMCA

## Work Experience

- 2021 – present **Machine Learning Intern** Hydro-Québec  
Development of machine learning models for solar radiation forecasting  
based on satellite data.
- 2019 – present **Research Assistant** Dr. Christopher Steele, Concordia University  
Development of analytical techniques for human quantitative MRI.
- 2018 – 2020 **Research Assistant** Dr. Peter Shizgal, Concordia University  
Computational modelling of reinforcement learning mechanisms. Optoge-  
netic activation of neurons mediating reinforcement in the rat.
- 2019 – 2020 **Supervisor, SL** Dept. of Biochemistry, Concordia University  
Supervising teaching assistants and developing the Strategic Learning (SL)  
program to provide wide access to academic aid for students.
- 2018 – 2019 **Teaching Assistant** Dept. of Biochemistry, Concordia University  
Group tutoring for strategic learning.
- 2016 – 2017 **Medical Coordinator** Equinoxe Virtual Clinic  
Patient care and communications with laboratories, hospitals, pharmacies,  
and medical specialists.
- 2017 **Research Assistant** Dr. Andrew Chapman, Concordia University  
Neurotransmitter effects on electrophysiological recordings in rat brain  
slices in vitro. reinforcement in the rat.
- 2016 **Research Technician** Derme & Co.  
Quality control of skin-care products.

## Education

- 2020 – present **M.Sc. in Computer Science, Machine Learning** MILA, Université de Montréal  
Professional Master's program through Montreal Institute for Learning  
Algorithms
- 2016 – 2020 **B.Sc. in Behavioural Neuroscience** Concordia University  
Mappin Medal: highest standing B.Sc. recipient  
J.W. Bridges Medal: highest standing within Dept. of Psychology  
**Bachelor Theses** Center for Studies in Behavioral Neuroscience  
- Optogenetics and Dopamine's role in Reinforcement Learning  
- Assessing Quantitative MRI through Multimodal Comparisons

## Publications & Selected Abstracts

- Currently finalizing two articles.
- 2021 **The trade-off between pulse duration and power in optical exci-  
tation of midbrain dopamine neurons approximates Bloch's law**  
*Pallikaras et Al.*  
bioRxiv
  - 2020 **Assessing quantitative MRI techniques using multimodal com-  
parisons.**  
*Carter et Al.*  
Organization for Human Brain Mapping
  - 2020 **Improving the speed of surface registrations.**  
*Carter et Al.*  
Quebec Bio-Imaging Network
  - 2019 **Questioning the role of phasic dopamine signaling in reinforce-  
ment learning.**  
*Carter et Al.*  
Society for Neuroscience Conference
  - 2019 **Serotonin 5-HT1A receptor-mediated reduction of excitatory  
synaptic transmission in layers II/III of the parasubiculum.**  
*Carter, F., and Chapman, C.A.*  
Neuroscience

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## About Me

I am continually searching for a way to learn more and expand my horizons. Always seeking to connect with those surrounding me, but I have a strong sense of autonomy, which I learned in part throughout my athletic career.

## Interests

- Reading
- Running / Hiking
- Cooking

## Notable Academic Awards

2019	Governor General All-Canadian	Rideau Hall, Government of Canada
2020	Alexander Graham Bell Doctoral Scholarship (105,000\$)	NSERC
	I declined this and FRQNT's awards	
2017 – 2019	3x NSERC Undergraduate Student Research Award	NSERC
2018 – 2019	2x President's Award, Academic Award	Concordia University
2018 – 2019	2x Molson Foundation Academic Excellence	FAEQ

## Athletic Accomplishments

2016 – 2019	<b>Member of Concordia wrestling team</b> Previously an athlete at the cegep, high school, and city levels. Through my dedication, I have competed nationally and internationally in Olympic freestyle wrestling, and developed the discipline and ability to perform under pressure.	
2018 – 2019	2x Canadian University Champion (68 kg)	USPORTS Canada
2018 – 2019	2x Individual Sports Excellence Bursary	FAEQ
2018	National Team Member - University World Championships	Goiana, Brazil
2018	Top 8 University athletes in Canada	USPORTS
2018	Male Athlete of the Year	Concordia University

## Volunteer Work

2017 – 2019	<b>Intensive Care Unit Volunteer</b> Guiding and supporting family members of patients, and shadowing medical procedures within the ICU Bridge Program.	Montreal General Hospital
2018	<b>Tutor for students with disabilities</b> Learned to adapt communication and material for people with difficulties. Taught the importance of compassion. Learned to adapt communication and material for people with difficulties.	Concordia Access Center
2013 – 2016	<b>High School wrestling coach</b> Learned to communicate skills and advice.	Vincent Massey Collegiate
2015	<b>Mentorship program for new athletes</b> Helped new students balance education and athletics.	Vanier College