Mohamed Akrout

https://makrout.github.io/

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Interests in the development of new artificial intelligence algorithms for optimal decision making

EXECUTIVE SUMMARY

- Computer scientist with 3 years experience in data science, focusing on the application of reinforcement learning and control theory to healthcare and neuroscience problems
- Successfully collaborated and published with theoretical neuroscientists from Vector Institute, University of Toronto and Google DeepMind.

EDUCATION

University of Toronto 2017-2018

- Masters in *Artificial Intelligence* and *Healthcare* , GPA: 4.0/4.0
- Supported students in the context of the Computer Science Mentorship Program.
- Addictive Mobility Scholarship based on academic merit.

Télécom ParisTech 2014-2016

- Joint dual degree between Télécom ParisTech & Polytechnique Montréal.
- Majors: *Economics & Statitics, Information Systems.*

Polytechnique Montréal 2011-2016

- Majors: *Computer Security, Software Engineering.*
- Minors: *Complex Systems & Simulation (Applied Mathematics).*
- Graduated with highest honors.

EXPERIENCE

Sensorimotor Computation Lab September 2018 - Present
Research Assistant *Toronto, Canada*

- Model how the brain learns to control motor behavior.
- Design and implement various reinforcement learning algorithms that are more biologically plausible.
- Manage the infrastructure of the lab (servers and GPUs).

Triage May 2018 - Present
Research Scientist *Toronto & Montreal, Canada*

- Implement reinforcement learning solutions to QA systems.
- Improve the skin diseases classification by incorporating patients' history.

Ecole Normale Supérieure June 2017 - August 2017
Computational Neuroscience Intern *Paris, France*

- Understood the mathematical models behind RNN variants which use Force Learning.
- Implemented the Force Learning technique on Nividia GPUs using PyCUDA and Theano.
- Modified the backpropagation algorithm by adding a finite rank perturbations.

Television of France (TDF) June 2016 - May 2017
Research Engineer *Paris, France*

- Implemented optimized algorithms to analyze data from SQL servers.
- Helped the top management to take decisions by providing BI dashboards and KPIs.

Gemalto July 2015 - December 2015
Technical Security Intern *Paris, Canada*

- Implemented a cryptographic tool in JAVA and Python using design patterns.
- Optimized human tasks and saved a half man-day per week from the team time.

Fluid Dynamics Lab May 2013 - August 2013
Research Intern *Montreal, Canada*

- Optimized numerical Navier-Stockes schemes using C++.
- Contributed to an official open-source OpenFoam project.

TECHNICAL & LANGUAGE SKILLS

- Programming languages: Python, Matlab and C++.
- Routine use of Linux (Ubuntu).
- Experienced in using TeX for scientific document typesetting.
- Languages: Fluent in English, French and Arabic; Familiar with Spanish.

SCHOLARSHIPS & AWARDS

- Mitacs Accelerate Program Scholarship - $30,000 (2018).
- Addictive Mobility Scholarship - $1,500 (2018).
- Award of Excellence of the Director General of Polytechnique Montréal (2016).
- Exchange Student Mobility Scholarship - $10,000 (2014-2016).
- Unit Participation and Initiation Research Scholarship - $1,500 (2013).
- TD Assurance Meloche Monnex Scholarship (2013).
- NSERC Undergraduate Scholaraship - $6,000 (2013).

PUBLICATIONS

- **M. Akrout**, C. Wilson, P. C. Humphreys, T. Lillicrap, D. Tweed. Deep Learning without Weight Transport. (under submission to *NeurIPS 2019*).
- **M. Akrout**, A.M. Farahmand, T. Jarmain, L. Abid. Improving Skin Condition Classification with a Visual Symptom Checker trained using Reinforcement Learning. *MICAAI 2019*.
- I. Akrout*, Amal Feriani*, **M. Akrout**. Hacking Google reCAPTCHA v3 using Reinforcement Learning. *RLDM 2019*.
- **M. Akrout**, A.M. Farahmand, T. Jarmain. Improving Skin Condition Classification with a Question Answering Model. *NeurIPS 2018 Workshop on Medical Imaging*.
- H. Zhu, **M. Akrout**, B Zheng, A. Pelegris, A. Phanishayee, B. Schroeder, G. Pekhimenko. TBD: Benchmarking and Analyzing Deep Neural Network Training. *IISWC 2018*.

PRESS COVERAGE

- Wired UK wrote an article "*Google's reCAPTCHA test has been tricked by artificial intelligence*" discussing our work to hack Google reCaptcha v3.
- Fast Company wrote an article "*Googles new reCAPTCHA has a dark side*" emphasizing on our methodology to hack Google reCaptcha v3.

MENTORING ACTIVITIES

- Workshop mentor at Canada Learning Code (2019 - Present).
- Student mentor at University of Toronto. Number of Mentorees: 2 (2018).
- Student mentor at Télécom ParisTech. Number of Mentorees: 1 (2017).

EXTRA-CURRICULAR ACTIVITIES

- Associations & Clubs : Canada Learning Code.
- Sports: Running, Basketball.
- Interests : Travel, Teaching, Reading, Playing chess.