Curriculum vitae

GABRIEL DESCOTEAUX

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Portfolio : https://gadese.github.io/

Overview

- Experience: computer vision (CV), robotics, deep learning, natural language processing
- Fluent in French and English
- Demonstrated excellent organizational, communication, teamwork and project management skills
- Working in a Linux environment with High Performance Computing (HPC)
- Proficiency in Python, C++, as well as experience with JAVA & MATLAB
- Eager to learn and face new challenges

Skills

Deep learning / Machine learning

- Tensorflow, Keras, scikit-learn
- Convolutional neural networks (CNN), transformer models (BERT), classical machine learning (K-means, SVM, etc.)
- OpenCV, Pandas, Numpy

Programming

- Python, C++, Java, Matlab
- Version control (Git)
- High Performance Computing, remote debugging, linux environment
- Robot Operating System (ROS), Gazebo

Others

- MS Office, Cooking mexican cuisine

Education

M.Sc in Mechanical Engineering – Robotics and Mechatronics systems **2018-2020**
Research Group in Design, Machine Learning and Optimization for Mechatronic Systems, Polytechnique Montréal

GPA: 4.00/4.00

Thesis: Autonomous feeding-assistance system for people with upper body disabilities

- Implement detection and localization in 3D of food in an image (Python & Tensorflow)
- Code pathplanning of a 6DoF robot arm (C++ & Python, ROS)

B.Sc in Electrical Engineering **2015-2018**
Polytechnique Montréal

GPA: 3.84/4.00

Graduated with a focus on AI, Computer Vision, Robotics and Controls

Publications

Coulombe, C., **Descôteaux, G.**, Barron, O., Gamache, J.F., Saussie, D., Achiche, S.,"Task Taxonomy for Autonomous Unmanned Aerial Manipulator: A Review", IDETC-CIE, 2020.

Engineering Experience

Research Scientist – Natural Language Processing
2020-Present
Nuance Communications

- Optimize natural language processing model (BERT) to meet client requirements using Tensorflow
- Test and compare new model architectures to baselines in order to evaluate improvements
- Develop techniques to improve NLP model performance on very small training sets: data augmentation, few-shot learning, post-training hand-designed techniques
- Contribute to adding new features to company software and maintaining codebase for company-wide tools using JAVA
- Work in a High Performance Computing environment (HPC) using remote servers and remote debugging

Research Development Intern – Computer Vision
2020
Nuance Communications

- Work on a proof-of-concept of a CV system to help doctors with note-taking during consultations
- Implement state-of-the-art computer vision algorithms for pose estimation and action detection in Python and Tensorflow/Keras following a literature review

Software Development Intern
2018
Analogic Canada

- Develop defect detection algorithms for X-ray images in order to automate the X-ray detector vetting process (Python)
- Converted existing C++ algorithms in Python

Research Intern in Robotics
2016-2017
Research Group in Design, Machine Learning and Optimization for Mechatronic Systems, Polytechnique Montreal

- Develop a control method for a 6DoF robot arm using facial recognition (C++)
- Test optimisation algorithms for the physical parameters of a drone in order to reduce energy consumption (Genetic Algorithm, Particle Swarm, Latin Hypercube Sampling, etc.)
- Contribute to the redaction of a publication on robust design methodology

Research Intern in Biomedical Imaging
2015
Laboratory of Optical Diagnoses and Imaging, Polyechnique Montreal

- Design a variable length reference arm for Optical Coherence Tomography (OCT) in order to reduce noise in a medical image without using software correction

Personal Projects / Student Groups

Personal Computer vision projects

- Kaggle Competition: predict car model, position and orientation from images
- Implement various algorithms for computer vision (ResNet, YOLO, Faster RCNN) in Keras

Other projects

- Rubik's cube self-solving robot
- Glove to measure forces within finger tendons for rock-climbing training (Final year project for my B.Sc.)
- 2-wheels self-balancing robot

PolyProject (Engineering student club)
2014-2018

- Technical group aiming to complete innovative projects. Projects completed: Fiber optics sensory glove, human-like robot hand
- Treasurer (2016-2017) and Public Relations Manager (2015-2016)

Honors & Awards

2019	*FRQNT research grant for M.Sc. students*
2018	*NSERC research grant for M.Sc. students*
2015, 2016, 2017	*NSERC Summer research grant for undergraduate research*
2015-2019	*Others by Polytechnique Montreal (for community involvement & academic performance): JA DeSève award, CMC Électronique award, Vedel award, Hatch Lt. award*