# Frédéric Branchaud-Charron

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 Github |  LinkedIn |  Scholar

## EXPERIENCE

### GLOWSTICK | Founding ML Engineer
June 2022 – June 2024 | Montréal, QC

- Built and deployed an **intent classification pipeline** for meeting processing using FastAPI, GCP, BERTopic, and HuggingFace.
- Built and deployed a system to match **CRM Objects** (SFDC, Hubspot) to customer's speech.
- Improved our **domain adaptation** capabilities with **topic modeling** resulting in 30% better precision.
- Led initiatives to improve our labeling with clear guidelines and **active learning** .

### SERVICENOW / ELEMENT AI | Applied Research Scientist
Jan 2019 – June 2022 | Montréal, QC

- Lead a small team of scientists and developers to develop Azimuth, an **error analysis tool** that leverages **explainability** techniques and **behavioral testing** to help users better understand their models.
- Managed the release of ServiceNow ATG's first open-source project by working closely with all stakeholders.
- **Fostered collaborations** with universities and industrial partners to improve the usage of active learning.
- Implemented state-of-the-art methods for active learning and released it as **Baal** , an **active learning** library in Python.
- **Championed the integration** of active learning in our Human-AI Interaction team where we helped labellers using active learning and machine teaching.

### SHERBROOKE UNIVERSITY | Msc by research & Research internship
May 2016 – Aug 2019 | Waterloo, ON

- Developed CSG, a metric for **dataset complexity estimation** .
- Developed centroid estimation models to improve vehicle tracking algorithms.
- Worked on MIO-TCD, an industrial dataset for vehicle localization.
- Developed algorithms for blob separation.

## OPEN-SOURCE

### azimuth 
Co-creator • API Design • Technical Leadership
Azimuth, an error analysis tool that help data scientists better understand their dataset and model predictions by performing thorough dataset and error analyses. The application leverages different tools, including robustness tests, semantic similarity analysis, and saliency maps. I acted as technical leader in the backend and contributed to the vision of the application.

### baal 
Co-creator • API Design • Experiments • Community development
BaaL, a Bayesian active learning library speeds up transition from research to production by providing a clean API. I contributed many API design decisions, experiment results and I am actively maintaining the library to the latest state-of-the-art.

### keras 
Community chair & Collaborator • Input pipeline • SSIM Loss • Tensorflow backend
My principal contributions were the Sequence API and the SSIM loss. I maintained the project for many years before the project was merged with Tensorflow. I was also project manager for keras-preprocessing, my goal was to maintain the library while Keras Preprocessing layers were developed.

## INDUSTRIAL RESEARCH

### BAYESIAN ACTIVE LEARNING. | ElementAI / ServiceNow
Jan 2019 – Present | Montreal, QC

- Improved **model's calibration** using Bayesian deep learning and Bayesian active learning.
- Improved the run time of active learning on **production settings** .
- Studied the effects of active learning on **discrimination** .
- Improved benchmarks in active learning, primarily with Synbols, a dataset generator.

# PUBLICATIONS

2022    Azimuth: Systematic error analysis for text classification
Gauthier-Melancon G., Marquez Alaya O., Branchaud-Charron F., & al. in proceedings at EMNLP 2022

2022    Stochastic Batch Acquisition for Deep Active Learning
Kirsch A., Farquhar S., Atighehchian P., Jesson A., Branchaud-Charron F., Gal Y. in proceedings at TMLR

2021    Can Active Learning Preemptively Mitigate Fairness Issues?
Branchaud-Charron F., Atighehchian P., Rodríguez P., Abuhamad G., Lacoste A., in proceedings at ICLR Workshop on Responsable AI, 2021

2020    Synbols: Probing Learning Algorithms with Synthetic Datasets
Lacoste A. & al., in proceedings at NeurIPS, 2020

2020    Bayesian active learning for production, a systematic study and a reusable library
Atighehchian P., Branchaud-Charron F., Lacoste A., in proceedings at ICML Workshop on Bayesian Deep Learning, 2020

2019    Spectral metric for dataset complexity assessment
Branchaud-Charron F., Aachkar A., Jodoin P., in proceedings at CVPR, 2019

2017    MIO-TCD: A new benchmark dataset for vehicle classification and localization
Luo Z., Branchaud-Charron F. & al. in press at IEEE Transactions on Image Processing, 2018

# EDUCATION

## SHERBROOKE UNIVERSITY
### MSc by Research in Computer Science
Dec 2018 | Sherbrooke, QC
GPA: 3.92/4.3

### BSc in Computer Science
Dec 2016 | Sherbrooke, QC
Dean's List (2 times)
GPA: 3.99 / 4.3

# SKILLS

## PROGRAMMING
Expert:
Python • FastAPI • BERTopic • LangChain • GCP • Docker • Dask • HuggingFace • Pytorch • Tensorflow • LaTeX • Bash
Familiar:
Java • C++ • C# • SQL • MongoDB • JS • Haskell • React

# COURSEWORK

## GRADUATE
Advanced Machine Learning
Time series
Open Source Software Engineering
(Teaching Asst)
Assembly and Python programming

## UNDERGRADUATE
Artificial Intelligence
Functional Programming
Computer Graphics

# SCHOLARSHIPS

2017    MITACS Acceleration
2017    FRQNT, MSc Scholarship
2017    Hydro-Québec, Recruitment Scholarship
2015-2016    NSERC, Experience Awards (IUSRA)