Frédéric Branchaud-Charron

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 Github | LinkedIn | G Scholar

Frédéric is an AI expert with 5 years of experience in developing real-world safe AI systems. He co-founded Baal and Azimuth, worked at ElementAI/ServiceNow, and has been published at top conferences. Combining scientific knowledge and engineering skills, Frédéric excels at developing AI projects from concept to production. He's now seeking to lead new AI initiatives and deliver client value.

EXPERIENCE

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

- Built and deployed an **intent classification pipeline** accurately detecting sales opportunities in hundreds of meetings per day 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 clearer guidelines and **active learning** which improved our F1 by 5% once completed.

SERVICENOW / ELEMENT AI | Staff 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.
- Oversaw the launch of **ServiceNow ATG's inaugural open-source project**, collaborating closely with all stakeholders.
- Implemented state-of-the-art methods for active learning and released it as **Baal**, an **active learning** library in Python.
- Led the research and deployment of **road defect detection** algorithms using **image segmentation** and active learning.

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

- Developed CSG, a metric for **dataset complexity estimation**. (Published at CVPR 2019)
- Developed centroid estimation models to improve **object tracking algorithms**.
- Curated MIO-TCD, an industrial dataset for **vehicle localization**.

OPEN-SOURCE

azimuth
Co-creator • API Design • Technical Leadership

Azimuth is an advanced error analysis tool designed to help data scientists gain deeper insights into their datasets and model predictions through comprehensive dataset and error analyses. As the technical lead on this project, I collaborated closely with project managers to enhance the platform with innovative algorithms and analytical features. Additionally, I spearheaded the open-source initiative, successfully navigating an 8-month process involving communication, alignment, and legal procedures to ensure a smooth and effective release.

baal
Co-creator • API Design • Research • Community development

Baal, a Bayesian active learning library speeds up the transition from research to production by providing SotA methods. I oversaw the development of the library and ran experiments leading to 4 publications at various conferences and workshops. In addition, I led the open-source effort of this library and built relationships with universities for collaboration.

keras
Community chair & Collaborator • Input pipeline • SSIM Loss • Tensorflow backend

I made significant contributions to the project, particularly through the development of the **Sequence API** and the **SSIM loss function**. Over several years, I played a key role in maintaining and advancing the Keras codebase until its integration with TensorFlow main repo. In addition to my work on Keras, I also served as the project manager for keras-preprocessing. In this role, I focused on maintaining the library and overseeing its evolution as Keras Preprocessing layers were developed.

INDUSTRIAL RESEARCH

BAYESIAN ACTIVE LEARNING | SERVICENOW / ELEMENTAI
Jan 2019 – Present | Montreal, QC

- Improved **model's calibration** using Bayesian deep learning and Bayesian active learning.
- Improved the **efficiency** of active learning on production settings by 90%.
- Studied the effects of active learning on **discrimination** .
- Improved benchmarks in active learning, primarily with Synbols, **an image 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 • GCP • Docker • Dask • HuggingFace • Pytorch • SQL • LaTeX • Bash
Familiar:
LangChain • OpenCV • C# • Tensorflow • 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)