Frédéric Branchaud-Charron

https://dref360.github.io/
frederic.branchaud.charron@gmail.com | 514-441-7292
Github | LinkedIn | Scholar

Frédéric has dedicated the past 5 years to safeguarding AI systems in real-world applications. As a former ElementAI employee, co-founder of Baal (a Bayesian active learning library) and Azimuth (an error analysis platform), he is a recognized expert in AI. With a perfect mix of scientific knowledge and engineering skills, Frédéric can take an AI project from inception to production. His work has been featured in NeurIPS, CVPR, and TMLR.

Now, Frédéric is eager to lead AI initiatives and devise strategic AI solutions for your business.

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 clear guidelines and **active learning** which improved our F1 by 5% when completed.

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 / MIOVISION | 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 helps 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 the 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 the 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 | ServiceNow / ElementAI
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 • GCP • Docker • Dask • HuggingFace • Pytorch • SQL • LaTeX • Bash
Familiar:
LangChain • Java • C++ • 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)