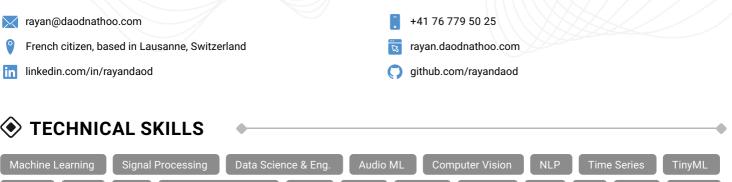


# Rayan DAOD NATHOO

Machine Learning Engineer

Experienced Machine Learning Engineer aiming to **develop solutions for real-world constrained problems**. I helped companies like **Bose** and **Logitech** innovate using novel technologies and acquired vital research and industry skills on the way. With experience in **Audio ML**, **Computer Vision**, **NLP**, **Model Compression**, and more, I am a team worker eager to learn and looking forward to the next challenge! Currently looking for impactful projects in AI/ML.

Pandas



## WORK EXPERIENCE

### **Machine Learning Engineer**

Bose 🗷

Python

#### 02/2023 - 08/2023

American company, multinational manufacturer of audio equipment for entertainment, home, ... (7k+ employees) Achievements

TensorFlow/PyTorch

- Designed & improved product-level Deep Learning models such as Speech Enhancement (SE) and Source Separation (on-device), using CNN-RNN-based encoder-decoders (U-Net-like, DCCRN, TCN, ...). Performed data analysis, feature extraction, and developed an objective evaluation pipeline.
- © Explored Model Compression (Knowledge Distillation (KD), Quantization, Pruning) and implemented a general purpose KD framework
- O Developed a novel KD method for SE models, particularly good in adverse conditions: publication under review for ICASSP 2024
- Collaborated with ML Engineers in 2+ projects and improved our codebase (new model capabilities, enhanced training script, Tensorboard plugins, ...)

### **Computer Vision Engineer**

#### Multimedia Signal Processing Group, EPFL @

05/2022 - 08/2022

Swiss University, laboratory specialised in multimedia signal processing (~10 members)

#### Achievements

- © Evaluated existing Semantic Segmentation (CNN) and Super-Resolution (GAN) methods with latency and hardware constraints
- O Deployed models in a real-time TV studio pipeline (Norway, UK, ...) Code, Publication, Reports project validated by the European Commission

## **Machine Learning Intern**

### Logitech 🗷

08/2021 - 03/2022

Swiss company, multinational manufacturer of computer peripherals and software (8k+ employees) Achievements

- Developed real-time **Deep Learning Target Source Separation** models: **1/** footstep extractor for gaming **2/** sound type manipulator (41 classes)
- Developed an end-to-end pipeline: data ingestion-processing-augmentation, models (CNN, RNN), evaluation, hyper-parameter tuning, prototyping
- O Demonstrated prototypes to the entire R&D department, UX Designers, Product Managers. Wrote and defended my Master's Thesis

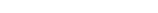
## EDUCATION

### **BSc & MSc in Computer and Communication Sciences** Swiss Federal Institute of Technology Lausanne (EPFL)

2015 - 2022

Software Engineering, Machine Learning, Signal Processing (GPA 5.1/6)

- Master Diploma supplement Machine Learning, Deep Learning, Image Processing, Audio and Speech Processing, Biomedical Signal Processing, Advanced Algorithms, Advanced Probabilities, TCP/IP, Mobile Networks, Information Security & Privacy, Modern Digital Communication, ...
- Master's Thesis: "Personalised Audio Enhancement" with Logitech's CTO office and Martin Vetterli's laboratory LCAV (EPFL)
- Semester Project at LCAV: Percussion Sample Classifier Data Engineering, Feature Extraction, Time-Frequency Analysis, Random Forest, CNN
- More projects: Twitter Sentiment Classification, Multi-Channel Noise Reduction, Direction Of Arrival Estimation, JUCE VST Plugin (C++ app), ...
- Activities: Master students representative, Event Manager -> Sponsoring Manager -> President of the Computer Science Student Association



Fixed-term contract - Lausanne, Switzerland

Internship - Boston, MA, USA (remote)

Internship - Lausanne, Switzerland

Lausanne, Switzerland

## CERTIFICATES

#### Coursera - TensorFlow Advanced Techniques (2023)

Custom Layers, Custom Loss Functions, Custom and Distributed Training, Advanced Computer Vision, Generative Deep Learning (4 courses - 80 hours in total)

#### Coursera - TensorFlow Developer Specialization (2022)

Convolutional Neural Networks, Natural Language Processing, Sequences, Time Series prediction (4 courses - 80 hours in total)

#### Coursera - Deep Learning Specialization (2022)

Neural Networks, Deep Learning, Hyper-parameter tuning, Regularization, Optimization, Convolutional Neural Networks, Sequence models (5 courses - 120 hours in total)

## PERSONAL PROJECTS

French Intent Classification for Chatbot C

 Intent classification for French language using pre-trained embeddings + Log. Reg. classifier. Data prep, training, evaluation, CLI (Pandas, Hugging Face)

#### Spoteezer 🗷

experience into products'

Reference letter : upon request

 Spotify-Deezer music link converter to help share music no matter the platform (Flask, HTML, CSS). <u>Try it now!</u>

"[...] hard worker, systematic and logical [...] produces reproducible and well-

documented code [...] cares deeply about the whole chain of turning users

Dr. Milos Cernak - Principal Engineer @ Logitech

## REFERENCES

#### Dr. Mikolaj Kegler - Audio ML Scientist @ Bose

"[...] can very quickly get a solid grasp of new concepts and clearly explain the key ideas to his coworkers. [...] performed an in-depth analysis of existing solutions, identified their limitations, and built on top of them to design significantly more powerful methods."

Reference letter : upon request

## **VOLUNTEERING & STUDENT JOBS**

### **CLIC Executive Committee**

Computer Science Student Association @

2018 - 2021 Roles

- President (20 21) Management (12 members + 5 commissions, CHF 90k+ annual budget), decision-making, internal/external representation
- Sponsoring (19 20) Canvassing, contract negotiations (brought CHF 5k+), contact with sponsors (big/small Swiss/international companies)
- Events (18 19) Organisation of 10+ events, logistics & inventories, team supervision (15+ staff members)

### Social Network Content Creator & Manager

EPFL IC School

2020 - 2022

Achievements

- Managed the EPFL Computer Science School social networks (Instagram, Twitter, Linkedin, Facebook)
- Launched and improved recurring concepts (IC Takeover, IC Connects, News, ...)

### **Student Assistant**

#### **Discrete Mathematics course**

2018 - 2020

Achievements

Support for students during the course "Advanced Information, Computation, Communication I"

LANGUAGES

French Native English Full Professional Proficiency (C2)

Spanish Elementary Proficiency (A2)

## • HOBBIES

Music Production - played piano for 10y, produce electronic music for 5 years now (Ableton Live, FL Studio, Cubase) Al/tech advances - stay upto-date by reading articles, listening to podcasts, watching videos, and attending conferences Self-improvement - read and learn about personal growth and try my best to apply recurring rules in life and work Travelling - Lived in Europe and West Africa, family across all continents, love discovering new places and new cultures