DR. HASSAN ISMAIL FAWAZ

Senior Machine Learning Engineer | PhD in Artificial Intelligence

@ hassanismailfawaz@gmail.com Saudi Arabia hfawaz publications

EXPERIENCES

Senior Machine Learning Engineer

Beyond Limits

Feb 2024 – Present Al Khobar, Saudi Arabia

- Scaling up and **load balancing** Large Language Models (**LLMs**)
- **Project Lead** at the client's site for a large oil and gas operator
- **Data** pipelines for **completion** and **instruction tuning**
- Maintain and develop LLMs in production (**GenAI** / LLMOps)
- Benchmark and evaluate various **vector databases** (e.g. OpenSearch, Weaviate, Qdrant) for information retrieval
- Run various experiments for advanced **Retrieval Augmented Generation (RAG)** systems
- Fine tune **embedding** models on private data using **contrastive** learning approaches
- Evaluate various techniques for fine tuning LLMs such as **QLORA** with **Mistral**, **LLama**, **Gemma**

Senior Machine Learning Engineer

Ericsson

May 2022 – Jan 2024 Paris, France

- **Data Architect**: Scaling **MLOps** framework for deep learning
  - Build on top of managed Elastic **K8s** in **AWS**
  - Setup **CI/CD** pipelines for infrastructure as code (**IAAC**)
  - Implement **experiment tracking** and serving using **MLFlow**
  - Ensure **reproducibility** via **Docker** and **Kubeflow**
- **Tech Lead**: In-house research project on **transfer learning**
  - Setup **best practices** for **Deep Learning** experimentation
  - Code review & **mentoring** of PhD students & data scientists
  - Implement state of the art models for **domain adaptation**
  - **Scale up Deep Learning experiments** on **Kubernetes**
  - Define the research project **roadmap** & team responsibilities
  - Lead a monthly **reading group** on Artificial Intelligence
  - Animate training **workshops** for software best practices
- **Machine Learning Engineer**: developing a microservice
  - Follow **software engineering** best practices
  - Review code, unit & integration tests, **CI/CD**
  - Interact with **Kafka** based communication system
  - Develop **ML Ops** & model **Life Cycle Management** (LCM)
  - Implement and investigate various design patterns
- **Data Engineer**: develop big data processing pipelines
  - **Spark** for extracting & normalizing **parquet** data
  - **Clustering** & **Forecasting** of **time series**

Machine Learning Engineer

Besedo

Oct 2020 – April 2022 Paris, France

EDUCATION

PhD in Machine Learning

Université Haute-Alsace

Sep 2017 – Sep 2020 Mulhouse, France

- Advancing **Deep Learning** for **Time Series Classification** (TSC) (link)
- Contributing to **Keras.io** with a tutorial on Convolutional Neural Networks for TSC (link)
- Open sourcing the ***dl-4-tsc*** framework with **1k+** GitHub stars (link)
- Publishing in top conferences and journals while reaching **#1 of all time** in DMKD (link)
- Student travel **award** for IEEE **Big Data** 2018 conference at Seattle (link)
- **International** collaborations: Monash University (**AUS**), Alan Turing Institute (**UK**), The Open University (**NL**)
- Teaching a **Deep Learning** course for masters students at ENSISA engineering school

Masters in Databases

Université de Bourgogne

Sep 2016 – Sep 2017 Dijon, France

- SQL, NoSQL, Graph
- Data Mining, Semantic Web
- Linear & Constraints Programming

Masters in Software Engineering

Université Antonine

Sep 2011 – Sep 2016 Beirut, Lebanon

- JAVA, C#, Multi-threading, Web Services
- Networking, CCNA Routers & Switches

DATA SCIENCE SKILLS

Computer Vision, NLP & LLMs
Torch, Pandas & HuggingFace
Hydra, & MLFlow
Algebra & Probability

DEVELOPMENT SKILLS

Object Oriented Programming
Software Design Patterns
Algorithms & Data Structures
Python, SQL, NoSQL
Time & Memory Complexity
MapReduce, Java, C++

- Content moderation using Machine Learning
- Benchmark latest **Computer Vision Deep Learning** models
- **Guide & mentor** junior data scientists and linguistics
- Evaluate **NLP transformer** models for **text classification**
- Develop **microservices** for live computer vision inference
- **Reduce latency** using quantization, pruning, JIT & tensorRT
- **Monitor** model **performance** and decay (e.g. accuracy)
- Evaluate concept & data **drift**, covariate & label **shift**
- **Orchestrate** and automate model training using Airflow
- Contribute to **HuggingFace**'s open source datasets (link)
- Deliver **proof-of-concepts** for ML models using **Streamlit**

Visiting Machine Learning Researcher

Monash University

Nov 2019 – Dec 2019 Melbourne, Australia

Classifying satellite image time series.

Deep Learning Lecturer

Université Haute-Alsace

Sep 2018 – 2021 Mulhouse, France

Giving an advanced course on deep neural networks.

Software Developer Intern

Orange Labs

Mar 2017 – Sep 2017 Nice, France

Java recommendation system based on **RDF triplet data**

Freelance Web Development

MradMCC

Mar 2016 – Aug 2016 Beirut, Lebanon

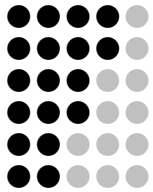
Creating a WordPress website that can be found here.

JOURNAL PUBLICATIONS

- Pialla, G. et al. (2023). "Time series adversarial attacks: an investigation of smooth perturbations and defense approaches". In: *International Journal of Data Science and Analytics*.
- Ismail Fawaz, Hassan, Benjamin Lucas, et al. (2020). "InceptionTime: Finding AlexNet for Time Series Classification". In: *Data Mining and Knowledge Discovery*.
- Ismail Fawaz, Hassan, Germain Forestier, Jonathan Weber, Lhassane Idoumghar, et al. (2019a). "Accurate and interpretable evaluation of surgical skills from kinematic data using fully convolutional neural networks". In: *International Journal of Computer Assisted Radiology and Surgery* 14, pp. 1611–1617.
- – (2019e). "Deep learning for time series classification: a review". In: *Data Mining and Knowledge Discovery* 33, pp. 917–963.
- Forestier, Germain et al. (2018). "Surgical motion analysis using discriminative interpretable patterns". In: *Artificial Intelligence in Medicine* 81, pp. 3–11.

OPERATION SKILLS

Git, Code Review, Unit Tests
Docker, Kubernetes
GitLab CI/CD Pipeline
High Perf. Computing (HPC)
Amazon Web Services (AWS)
REST, gRPC, Message Brokers



CONFERENCE PAPERS

- Ismail-Fawaz, A. et al. (2023). "ShapeDBA: Generating Effective Time Series Prototypes using ShapeDTW Barycenter Averaging". In: *ECML/PKDD Workshop on Advanced Analytics and Learning on Temporal Data*.
- Pialla, Gautier et al. (2022). "Smooth Perturbations for Time Series Adversarial Attacks". In: *Pacific-Asia Conference on Knowledge Discovery and Data Mining*.
- Mathis, Florian, Hassan Ismail Fawaz, and Mohamed Khamis (2020). "Knowledge-driven Biometric Authentication in Virtual Reality". In: *Extended Abstracts of the 2020 CHI Conference on Human Factors in Computing Systems Extended Abstracts*.
- Rakhshani, Hojjat et al. (2020). "Neural architecture search for time series classification". In: *IEEE International Joint Conference on Neural Networks*.
- Ismail Fawaz, Hassan, Germain Forestier, Jonathan Weber, Lhassane Idoumghar, et al. (2019b). "Adversarial Attacks on Deep Neural Networks for Time Series Classification". In: *IEEE International Joint Conference on Neural Networks*.
- – (2019f). "Deep Neural Network Ensembles for Time Series Classification". In: *IEEE International Joint Conference on Neural Networks*.
- Ismail Fawaz, Hassan, Germain Forestier, Jonathan Weber, François Petitjean, et al. (2019). "Automatic alignment of surgical videos using kinematic data". In: *Artificial Intelligence in Medicine*.
- Ismail Fawaz, Hassan, Germain Forestier, Jonathan Weber, Lhassane Idoumghar, et al. (2018a). "Data augmentation using synthetic data for time series classification with deep residual networks". In: *International Workshop on Advanced Analytics and Learning on Temporal Data, ECML/PKDD*.
- – (2018b). "Evaluating surgical skills from kinematic data using convolutional neural networks". In: *International Conference On Medical Image Computing and Computer Assisted Intervention*, pp. 214–221.
- – (2018d). "Transfer learning for time series classification". In: *IEEE International Conference on Big Data*, pp. 1367–1376.