

MICHAËL SOUMM, PHD

DEEP LEARNING RESEARCHER

CONTACT

+33 6 99 43 13 06
soumm.michael@gmail.fr
Paris, France

SKILLS

ML Frameworks: Advanced experience in PyTorch; working knowledge of TensorFlow and Sklearn

Math skills: Probability, Statistics, Optimization, Linear Algebra, Analysis

Research Domains:

- Representation learning
- Deep learning analysis
- Computer Vision
- Generative Modeling
- Recommender Systems

EDUCATION

PhD. in Deep Learning

Université Paris-Saclay

2021-2024

Refining Machine Learning Evaluation: Statistical Insights into Model Performance and Fairness

MVA | MSc. in Deep Learning

ENS Paris-Saclay

2021

Mathematics, Vision, Learning

ENSAE | MSc. in Statistics and Economics

ENSAE Paris

2021

Data Science, Statistics, Learning

LANGUAGES

French: Mother tongue

Russian: Mother tongue

English: Fluent, TOEIC 990/990

Japanese: Basics

German: Basics

PROFILE

Deep Learning researcher with expertise in model evaluation, fairness, and representation learning. Three years of experience in deep learning across computer vision, NLP, and recommendation systems. Solid applied (**MVA MSc.**) and theoretical (**ENSAE Paris MSc.**) knowledge, consistently ranked in the top 5% in DL, CV, and NLP courses. Three papers published at WACV, and one paper currently under review.

EXPERIENCE

Postdoctoral Researcher in Deep Learning

2025 - now

IDS (Télécom Paris) / MLIA (Sorbonne Université), supervised by P. Gori and A. Newson

Disentangled and Controllable Latent Representations for Computer Vision and Medical Imaging.

- Developing **structured latent representations** for medical imaging, focusing on disentangling healthy and pathological brain patterns in neuroimaging.
- Adapting contrastive learning to enhance **interpretability** in psychiatric disorder diagnostics.
- Investigated **diffusion models**, optimizing their latent space structure for improved synthesis and analysis of neuroimaging data.

PhD. in Deep Learning

2021-2024

CEA LIST, supervised by A. Popescu, directed by B. Delezoide

PhD Title: Refining Machine Learning Evaluation: Statistical Insights into Model Performance and Fairness.

- Developed and integrated statistical methodologies to improve the robustness and interpretability of deep learning model evaluations in 3 fields
- Studied the impact of pre-training and architectures for **Class Incremental Learning (CIL)**, identifying key factors affecting performance, with results published in WACV 2024.
- Investigated **biases in Face Recognition** systems, quantifying demographic disparities, with findings under review. Showed how using **conditioned generation** can reduce biases, accepted in WACV 2025.
- Developed novel information metrics to characterize difficult users for **Recommender systems**, and studied their impact on performance. Work under review.

Research Internship in Deep Learning

2021

CEA LIST / Valeo, supervised by F. Chabot

Self-supervised depth prediction from monocular images. Goal: perform depth prediction for autonomous driving.

- Crafted a Vision Transformer U-Net pipeline for Depth prediction.
- Adapted the model to a self-supervised setup.

PUBLICATIONS

Preprint. Quantifying User Coherence: A Unified Framework for Cross-Domain Recommendation Analysis. *M. Soumm, A. Fournier-Montgieux, A. Popescu, B. Delezoide*

WACV 2025: IEEE/CVF Winter Conference on Applications of Computer Vision. Face Recognition Dataset Balancing for Fairer Face Verification. *A. Fournier-Montgieux, M. Soumm, A. Popescu, B. Luvison, H. Le Borgne*

Preprint. Causal Inference Tools for a Better Evaluation of Machine Learning. *M. Soumm*

WACV 2024: IEEE/CVF Winter Conference on Applications of Computer Vision. An Analysis of Initial Training Strategies for Exemplar-Free Class-Incremental Learning *M. Soumm, G. Petit, E. Feillet, A. Popescu, B. Delezoide, D. Picard, C. Hudelot*

WACV 2023: IEEE/CVF Winter Conference on Applications of Computer Vision. Vis2Rec: A Large-Scale Visual Dataset for Visit Recommendation. *M. Soumm, A. Popescu, B. Delezoide*