Laurent Fainsin

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EDUCATION

ENSEEIHT INP-TOULOUSE
Master in Perf. Computing focused on Academic Research
2022 — 2023 | Toulouse, France

ENSEEIHT INP-TOULOUSE
MEng in Computer Science specialty in ML and CG
2020 — 2023 | Toulouse, France

LA PÉROUSE-KERICHEN
Preparatory class (CPGE) PCSI, PSI
2018 — 2020 | Brest, France

SKILLS

PROGRAMMING
Python, Julia, Shell, Java
C++, CUDA, SQL, LaTeX

LANGUAGES
Fluent: English, French
Elementary: Japanese, Spanish

CERTIFICATES
French driver's license
Cambridge Linguaskill C1+
AI for Medical Diagnosis
HuggingFace courses

ABOUT

PERSONAL PROJECTS
Reproducible Nix Infrastructure
Handwriting Denoising Diffusion
GBA Collaborative Emulator
SSL on Histology Datasets
"AI or NOT" Hackathon
Diffusers.jl

SCHOOL PROJECTS
JPEG & MPEG Compression
Distributed Data Tuple Space
3D Inverse Problem Solver
Graph Machine Learning
OpenGL Mesh Renderer

OSS CONTRIBUTOR
NixOS, HuggingFace
LightningAI, AliceVision

HOBBIES
Aquariums, OSS
Slacklining, Padel

PROFESSIONAL EXPERIENCE

SAFRAN | Machine Learning Engineer Intern
March 2023 — September 2023 | Paris, France

- Studied state of the art generative models for 3D data, such as PointNet++, Graph U-Net, PointFlow, Point Voxel Diffusion and LION.
- Implemented a dozen architectures using libraries such as PyTorch Geometric, PyTorch Lightning, HuggingFace Diffusers, HuggingFace Datasets, etc. Settled on Latent Diffusion Models and classic model reduction methods.
- Trained models on specific aircraft industrial parts, conditioned on performance metrics, such as drag coefficients, lift coefficients, etc. Evaluated the models using Gaussian Processes and geometrical metrics.
- Released internally the models and code, enabling Safran engineers to generate new parts with specific performance metrics and to easily reuse the code for other applications. Submitted a patent.

REVA — IRIT | Machine Learning Scientist Intern
June 2022 — September 2022 | Toulouse, France

- Fine-tuned a state of the art deep learning model (DETR) to detect spherical markers in images for photometric stereophography calibration.
- Collaborated with 3 engineers from MIKROS and Technicolor as part of the ALICIA-Vision Labcom european project.
- Monitored hundreds of trainings using the MLOps platform Weights & Biases. Achieved 90% GIoU on test data, providing fast and accurate segmentation.
- Built using the Pytorch Lightning framework, exported to ONNX format, deployed to production in AliceVision with ONNXRuntime.

VOLUNTEER EXPERIENCE

NET7 / INP-NET | Treasurer / President
September 2021 — September 2022 | Toulouse, France

- Led and managed the association and its financing for a term of one year.
- Contributed to and developed the codebase used by 5000+ students per year. Provided technical micro-trainings to hundreds of students.
- Planned and started the migration of our server room to an *infrastructure as code* Proxmox + Kubernetes virtual cluster.
- Acquired solid skills in system administration and its tools: Docker, Git, Kubernetes, NixOS, NGINX, Apache, Redis, LDAP/CAS, CI/CD, etc.

TOULOUSE HACKING CONVENTION | Volunteer
April 2022 | Toulouse, France

- Helped set up and tear down the equipment for the 2 day event.
- Assisted in the hardware CTF organization after the event.

CAPITOLE DU LIBRE | Volunteer
November 2022 | Toulouse, France

- Helped with the "nix install party" of the 2 day event.
- Promoted free software and introduced attendees to GNU+Linux.

PUBLICATIONS & PATENTS

[1] L. Fainsin, J. Mélou, L. Calvet, A. Laurent, A. Carlier, and J.-D. Durou, "Neural sphere detection in images for lighting calibration," *QCAV*, 2023.

[2] L. Fainsin, X. Roynard, M. A. Bucci, and B. Staber, "Latent Generative Models for Conditional 3D Unstructured Mesh Blade Design," 2023