Vincent Roger, (PhD)

Passionate Data and Machine Learning Scientist

roger.vincent.11@gmail.com +336 33 25 61 97
1 Rue Saint-Dominique; 31000 Toulouse
vincent-roger.fr vroger11 vroger11 Vincent-Roger

Skills

AI Project Lifecycle: Audit, study of needs, data collection, feature engineering, model development, prototyping, deployment, and post-deployment maintenance.

Machine Learning Techniques: Supervised, self-supervised, and semi-supervised learning; deep neural networks for both big and small data; sequence learning (RNNs, GRUs, transformers, HMMs); natural language processing (speech-to-text, speech/audio synthesis, LLM); generative models (Diffusion, GANs, DPGMMs); neural network optimization (compilation and quantization).

Data Engineering & Visualization: Big data analysis, signal processing (image and audio), interactive visualizations.

MLOps: Cloud deployment and storage (OVH, S3-compatible solutions); API development (FastAPI); microservices (Docker); CI/CD (GitHub Actions and GitLab CI/CD); testing (Pytest); model tracking (MLFlow); data versioning (DVC); dependency management (UV, Conda and Poetry).

Programming Languages & Tools: Python; SQL (DuckDB); Numpy, Scipy; PyTorch, Lightning, TorchAO, TensorRT; Scikit-learn; Pandas/Polars; Plotly; Streamlit; Diffusers; Transformers, llama-cpp.

Project Management: Organization (Second Brain philosophy), leadership, team collaboration, risk management, deadline handling, solution design and technical documentation (MkDocs).

Languages: French (Native), English (C1).

Work Experience

Lead Data Scientist, ongoing, *REEV* — Toulouse — 2025–Now

Contributing to the development of the DREEVEN robotic orthosis.

- Introduced MLOps practices including CI/CD, data versioning with DVC, and experiment tracking with MLflow.
- Built the ingestion interface for DREEVEN experiment data to produce raw versioned datasets.
- Integrated Label Studio to build training datasets, aligning sensor signals and video annotations using device audio.
- Developed an activity detection model as the team's second POC.
- Delivered the initial version of validation and verification tooling for all models.
- Supervised model development, tooling evolution, and integration of ONNX models into the embedded device.

Machine learning and data engineer, 2y 5m, *Kiviak Instrument* — Toulouse — 2023–2025

Remote work with responsibilities of data and technology choices.

- Leading and developing sample generation models based on diffusion models.
- Designed and developed models integrated as microservices for automatic music sample labeling.
- Created and maintained ML-focused databases.
- Developed and optimized new real-time DSP algorithms (time-stretching and pitch-shifting).
- Built signal processing APIs and contributed to the frontend in TypeScript.

PhD, 3y 3m, *IRIT* — Toulouse — 2018–2022

People with ENT cancers have speech difficulties after surgery or radiation therapy. It is important for the practitioner to have a measure that reflects the severity of speech. Developed two approaches for automatic speech assessment, despite having limited data (about 1h of audio recordings for 128 speakers). The first one is based on "few shot" methods, while the second one is based on entropic measurement of speech features (learned with a self-supervised model on an annexed corpus). Our results on the latter have allowed us to consider a medical application. Thus, I obtained a grant to supervise an engineer in order to realize an application delivered to the Toulouse University Hospital.

Study Engineer, 2y, *LIS* — Toulon — 2016–2018

Following my previous contract, I created a deep self-supervised model representation of underwater acoustic environments to help categorize the different behaviors of cetaceans within range of buoys. I then created a deep model for the classification of 1500 bird species. For these two problems, I had large volumes of data.

Study Engineer, 10m, *LIS - TVT Innovation* Toulon 2015-2016
Following the installation of buoys in the sea equipped with microphones, we collected large quantities of data. My work consisted in modeling the bioacoustic environment using generative models. Thanks to this, I was able to produce a report of narwhal activities in relation to lunar activity.

Projects

Hackaviz 2025 Participation 2025
Proposed a dashboard in Hackaviz competition using Python, Streamlit and Plotly to create interactive data visualizations. Live demo: `https://vroger11-hackaviz-2025.streamlit.app/`. Code repository: `https://github.com/vroger11/hackaviz-2025`.

Tutorials to create SpeechBot 2025 - Ongoing
An innovative voice assistant integrating advanced speech recognition (speech-to-text), large language models (LLM), and speech synthesis (text-to-speech) for a seamless interactive experience. Designed for tutorials on my website. Code here: `https://github.com/vroger11/SpeechBot`.

Tutorials on Image Generation with Diffusion Models 2024
Created a series of tutorials to teach the Diffusers library, covering key concepts and practical implementations. All code is available on GitHub, and the tutorials are published on my blog. More details can be found here: `https://github.com/vroger11/diffusers-tutorials`.

Online Esports Visualizations 2022
Developed data-driven visualizations for Age of Empires 2 tournaments by collecting and analyzing data from web APIs. The visualizations gained significant traction, accumulating over 100k views and hundreds of comments on Reddit. Explore the related blog posts here.

Teaching

Substitute Teacher, Paul Sabatier University Toulouse 2019-2021
Taught Python, probability and statistics, machine learning, and networking to undergraduate and master's students, totaling 162 hours. Supervised machine learning projects on automatic speech recognition and introduced students to TensorFlow.

Substitute Teacher, University of Toulon Toulon 2017-2018
Taught machine learning (TensorFlow), algorithmics, and graph theory to undergraduate and master's students, totaling 85 hours, while also contributing to course material development.

Education

PhD, Computer Science, *Paul Sabatier University* Toulouse 2022
Enhanced public speaking skills through presentations and radio appearances.

Master Degree, Artificial Intelligence, *Paul Sabatier University* Toulouse 2015
Statistical models, Signal Processing, Pattern Recognition, Robot control, and Management.

Bachelor Degree, Computer Science, *Paul Sabatier University* Toulouse 2013
Fundamental in development tools, low-level programming, Statistics, Probabilistic and Calculus.

University degree in technology, Computer Science, *IUT Paul Sabatier* Toulouse 2011
Two-year degree in computer science, focusing on application design for industry use cases.

Associations

Volunteer work, ongoing, *Toulouse Data Science* Toulouse 2023-Now
Organization of in-person events.

Volunteer work, 1y 6m, *Toulouse Dataviz* Toulouse 2022-2024
Organization of in-person events, the creation of posters, and the delivery of training sessions for middle school students and the general public.

Hobbies

Blogging: About data visualization, Machine Learning and tutorials.

Sports: Disciplined athlete, completed the Toulouse Marathon, training regularly in weightlifting and running.

Readings: I read about productivity, health, sport and Japanese Shōnens.