Matthias **Bienvenu**

2 Rue Geoffroy Saint-Hilaire, 91000 Évry-Courcouronnes
(+33) 7 83 57 49 98 matthias.bienvenu@telecom-sudparis.eu matthiasbienvenu

Education

Télécom SudParis, Institut Polytechnique de Paris - Engineering degree — Évry, France
2nd year of General Engineering degree in Digital Technologies (Equivalent Master year 1) — 2024 – Present

Lycée Clemenceau — Preparatory Classes (MP2I → MPI*) — Nantes, France
Two-year intensive program in Mathematics, Computer Science and Physics — 2022 – 2024

Profile

- Seeking a **research internship** from early **July to late August 2026**.
- Second-year engineering student, curious and motivated, with a passion for solving complex problems.
- Actively involved in school associations and a strong team player.
- Holds a valid driving license.

Skills

Programming Languages Python, Rust, OCaml, C, C#, Bash, Java, Lua, SystemVerilog

Frameworks

Machine Learning and Data Science: PyTorch, Stable-Baselines3

Game Development: Unity, Garry's Mod (Valve's Source engine), s&box (Valve's Source 2 engine)

Micro-Controllers: Arduino, 8051 assembly (AT89 series)

Compiler Developpement: Java JFlex, Java CUP

Projects

Most of my project can be found on my GitHub .

Participation in the Autonomous Car Race at ENS Paris-Saclay 2025 (CoVAPSy)

High-level programming lead, INTech, the robotics association of Télécom SudParis

- Trained PPO agents in the Webots simulator using LiDAR + camera inputs with PyTorch + Stable-Baselines3
- Designed CNN architectures with residual connections and two-layer convolutional blocks inspired by ResNet (Dropout + BatchNorm)
- Optimized models for embedded inference on Raspberry Pi 5 via int8 quantization and ONNX export
- Parallelized multiple simulation environments to accelerate training using IPC (named pipes) and process synchronization
- Project starred by lead developer of Stable-Baselines3

AI Training Sessions

Co-head of AI division, Télécom SudParis branch of Kryptosphère

- Designed and delivered ~10 training sessions (~1.5h each) combining slides and practical labs
- Covered a range of neural network architectures: MLPs, CNNs, RNNs, LSTM, GRU, ResNet
- Taught implementation and best practices in PyTorch, used regularly for 4+ years
- Guided peers in hands-on applications of ML concepts

Chess Project (TIPE) - Preparatory Class (MPI*)

- Applied language theory concepts to create a custom chess language with explicit tokens for pieces, moves, actions, and board context
- Trained a small autoregressive RNN on translated chess datasets to study learned patterns
- Analyzed cosine similarity between tokens, revealing correlations between semantically related game elements

- Investigated RNN memory limitations for board state tracking (> 6-8 moves)

Digital Design Intern - NXP Semiconductors

- Analyzed a frequency estimation algorithm for carrier frequency offset (CFO) in wireless communications (Wi-Fi, Bluetooth, radio)
- Benchmarked against state-of-the-art estimators across different algorithm parameters and SNR scenarios
- Developed a testbench for an internally developed processing unit, enabling execution of custom assembly and implementation of the algorithm
- Studied and applied signal processing literature to implement algorithmic estimators
- Gained foundational experience in SystemVerilog and digital design

Swarm Rescue Challenge - Institut Polytechnique de Paris (Ongoing)

- Competing in a 2D multi-drone rescue challenge with 10 drones navigating mazes to save agents
- Implementing world representation and graph-based navigation using a quad tree to handle obstacles
- Fusing odometry and noisy GPS data with a Kalman filter for robust localization
- Developing pathfinding (A* / D*) and MLP-based trajectory following to maximize performance within the simulator

Campus Network Association (MiNET) — Télécom SudParis / IMT-BS

- Managed network and server infrastructure for 800 members (20+ Proxmox VE servers, HP ProLiant servers, VMs/LXC, Cisco devices)
- Deployed and experimented with large language models on association servers using open-source frameworks (Ollama, llama.cpp, prima.cpp, gemma.cpp, Open-WebUI, LibreChat)
- Gained hands-on experience in systems for AI model deployment and scaling

Learning the Rust Programming Language

- Studied Rust for its functional programming features and memory safety guarantees
- Implemented projects from scratch: JSON parser, PNG-inspired file format parser, Sudoku solver using backtracking
- Solved numerous Advent of Code 2024–2025 challenges, applying algorithmic problem-solving in Rust

Unity 3D Game Project

- Developed a 3D-rendered game in a team of five
- Implemented shader graphs and particle systems
- Designed project architecture (abstract/virtual classes, interfaces) and produced UML diagrams
- Programmed boss behavior in C#

INT Game Jam

- Developed a C-based rendering engine on Raylib entirely based on the ray-marching algorithm in a team of three
- Implemented maps as mathematical signed distance functions (SDFs) evolving over time and position in separate GLSL shaders