Giulio Carpi

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PROFESSIONAL EXPERIENCE

Software Engineer Intern, ***Siemens Digital Industries Software***, *Toulouse, France* **Feb 2025 - Aug 2025**

- Developed a 3-layer module (C# WPF UI → C++/CLI interop → native C++) processing real-time sensor data for collision avoidance and reactive trajectory planning.

Skills Developed: **C++**, **C#**, **C++/CLI**, **.NET (WPF)**, **Visual Studio 2022**, **Git/Git Extensions**, **Scrum Methodology**.

Software Engineer Intern, ***Cemosis - CNRS spin-off***, *Strasbourg, France* **Jun 2024 - Aug 2024**

- Built a C++ pipeline that sourced urban elevation data via Mapbox Terrain-RGB API, processed it and generated Delaunay 3D terrain meshes constrained to contour lines. Part of European HiDALGO2 and NumPEx Exa-MA for exascale computing.

Skills Developed: **C++**, **Visual Studio Code**, **Git**, **GitHub**, **Docker**, **CI/CD tools**, **MeshLab**, **Gmsh**, **Agile Methodology**.

ACADEMIC PROJECTS

Symbolic Regression **Nov 2024 - Jan 2024**

- Built a reduced-order model for 1D advection-diffusion PDE using finite differences, convolutional autoencoder (PyTorch) for latent compression, and SINDy-like symbolic decoder for interpretable expressions.

Exa-MA WP1 - Vegetation **Mar 2024 - Jun 2024**

- Developed a C++ application sourcing urban vegetation data from OpenStreetMap via the Overpass API and integrating it into 3D urban models to enhance thermal and energy simulations.

EDUCATION

MSc in Applied Mathematics *University of Strasbourg, France* **Sep 2023 - Aug 2025**
Specialization: Scientific Computation and Mathematics of Innovation

- **Key Subjects:** Machine Learning and Deep Learning (TensorFlow, PyTorch, scikit-learn), Scientific Machine Learning (PINNs, ROM), Data Processing and Mining, Numerical Methods for PDEs (FEM, FVM), Signal and Image Processing, High-Performance Computing (MPI, OpenCL, GPU), Optimization, Uncertainties, Databases (SQL/NoSQL).

BSc in Applied Mathematics *University of Strasbourg, France* **May 2023**

- **Key Subjects:** Differential and Integral Calculus, Ordinary Differential Equations, Computer Science, Probability and Statistics, Linear Algebra, Fourier Analysis.

TECHNICAL SKILLS

Programming Languages/Frameworks: C/C++, C#, C++/CLI, Python, Julia, R, SQL, Bash.

Libraries & Tools: TensorFlow, PyTorch, scikit-learn, NumPy, Pandas, Matplotlib, CGAL, .NET (WPF), OpenCL, MPI.

Machine Learning & AI: Regression, Classification, Clustering, Neural Networks (ANN, RNN, CNN), Deep Learning, Generative Models, Scientific ML, Uncertainty Quantification.

Modeling, Simulation, & Optimization: Numerical Methods for PDEs, FEM, FVM, Optimization Techniques.

Other: Git/Git Extensions/GitHub, Docker, CI/CD, Visual Studio, Agile/Scrum Methodologies.

LANGUAGES

English (Professional proficiency - C1) • **French** (Native speaker) • **Italian** (Native speaker)