

■ SANTERAMO IN COLLE · IT ■ BORN 1989

Francesco Perniola

SENIOR SOFTWARE ENGINEER · SOLUTION
ARCHITECT · AI ENGINEER

I work on software architecture and AI features embedded in products that run in production. Most of what I do runs on on-premise infrastructure, with real constraints on hardware and delivery timelines.

LOCATION	Santeramo in Colle (BA) Italy
WEBSITE	perniola.pages.dev
LINKEDIN	/in/francesco-perniola
LANGUAGES	Italian · English B2
TRL	6-9 · Production
AVAILABILITY	Full-time roles

§ 01 Profile

FULL-STACK · ARCHITECT · AI

Senior Software Engineer with fifteen years of full-stack experience and architectural responsibilities. I lead a team of about ten engineers on TRL 6-9 products: event-driven industrial IoT platforms, multi-module smart city systems, and LLM features embedded in the products we deliver to clients. I'm the author of the company's Software Development Operating Guidelines, which formalize the internal SDLC, the four-role responsibility matrix, the governance of AI agents, and Knowledge Management on a corporate RAG. In parallel I run R&D in deep learning and computer vision: medical imaging and road surface classification on DICOM pipelines in PyTorch and TensorFlow.

§ 02 Experience · Current

DYRECTA LAB · TECH LEAD

JUN 2021 - PRESENT

Dyrecta Lab · Conversano (BA), Italy

Senior Software Engineer · Solution Architect

TECH LEAD · ~10 ENGINEERS · METHODOLOGY · CLIENT-FACING

- Technical leadership of about ten engineers; coordination with Project Management Team, Project Managers, and end clients.
- Author of the company's Software Development Operating Guidelines: four-role responsibility matrix, macro-workflows Kanban→Scrum for MVP, Water-Scrum-Fall for legacy, Day-2 operations, governance of AI agents in the SDLC, Knowledge Management via corporate RAG over Execution Reports.
- Direct stakeholder management with clients: requirements workshops, technical presentations to the client's board, presales support, multi-option advisory on stack and architecture before project kick-off.
- Client-facing assessments with structured risk register (Impact × Probability × Mitigation), estimates with explicit variance, documented assumptions, WBS partitioned into work streams (stability, compliance, evolutionary features), managerial-level synthesis.
- End-to-end software architecture on TRL 6-9 products: requirements analysis, stack selection, HLD/LLD, algorithm design, development reports.
- Event-driven industrial IoT platforms over MQTT: multi-sensor correlation on asynchronous timestamps, logarithmic triangulation, geometric digital twins, anomaly detection with passive baseline learning.
- Multi-module smart city platform (air quality, sharing, parking, traffic monitoring): cross-module MQTT, Docker Compose, PostgreSQL+TimescaleDB, Redis, CPU-only XGBoost.
- AI features in client products: RAG, agents with tool calling, domain-specific chatbots, internal copilots. Prompt engineering for development and governance.
- R&D in deep learning and computer vision: tumor segmentation from CT scans, road surface classification, custom DICOM pipelines (PyTorch, TensorFlow).

§ 03 *Signature works*

ARCHETYPES · UNDER NDA

<p>A.01 2023 -</p> <h3>Smart City & Mobility Platform</h3> <p>SOLUTION ARCHITECT · TECH LEAD</p> <p>Multi-module platform orchestrating air quality, sharing, parking, and traffic monitoring via cross-module MQTT. CPU-only ML over high-cardinality time-series.</p> <hr/> <p>NESTJS · REACT · TIMESCALEDB · REDIS · MQTT · XGBOOST</p>	<p>A.02 2024 -</p> <h3>Industrial Safety IoT System</h3> <p>SOLUTION ARCHITECT</p> <p>Model-agnostic architecture for asynchronous multi-sensor correlation. Logarithmic triangulation, geometric digital twin, anomaly detection with passive baseline learning.</p> <hr/> <p>PYTHON · DJANGO · CELERY · REDIS · POSTGRESQL · EVENT-DRIVEN</p>
<p>A.05 2026 -</p> <h3>Software Development Operating Guidelines</h3> <p>METHODOLOGY ARCHITECT · AI GOVERNANCE</p> <p>Company document that formalizes the SDLC: four-role responsibility matrix, three macro-workflows (Kanban→Scrum, Water-Scrum-Fall, Day-2), AI agent governance, Knowledge Management on a corporate RAG.</p> <hr/> <p>RESPONSIBILITY MATRIX · SDLC · AI GOVERNANCE · CORPORATE RAG · LLAMAINDEX · PINECONE</p>	<p>A.03 2022 -</p> <h3>Production LLM Features in Client Products</h3> <p>AI ENGINEER · ARCHITECT</p> <p>RAG systems, agents with tool calling, domain-specific chatbots, and internal copilots embedded in client products. Prompt engineering for development and AI governance inside the pipelines.</p> <hr/> <p>RAG · LLM AGENTS · EMBEDDED DEPLOY · PROMPT ENGINEERING</p>
<p>A.04 R&D</p> <h3>Medical Imaging — Tumor Segmentation</h3> <p>ML RESEARCH ENGINEER</p> <p>Neural networks for tumor detection and segmentation from CT scans. Custom DICOM pipelines, training on dedicated GPUs, on-premise embedded inference.</p> <hr/> <p>PYTORCH · TENSORFLOW · DICOM · COMPUTER VISION</p>	<p>A.06 2024 -</p> <h3>Retail Digital Twin Platform</h3> <p>SOLUTION ARCHITECT · TECH LEAD</p> <p>Retail shelf Digital Twin for large-scale grocery retail across multiple stores. Volumetric OSA, multi-tenancy with Row-Level Security, operator-assisted calibration, BI dashboard for operational KPIs.</p> <hr/> <p>DJANGO · DRF · MQTT · CELERY · TIMESCALEDB · APACHE SUPERSET</p>
<p>A.07 2025 -</p> <h3>Clinical Data Platform — Gap analysis & roadmap</h3> <p>SOLUTION ARCHITECT · ANALYSIS LEAD</p> <p>Technical assessment of a clinical platform (patient records, visits, computations, reporting). Gap analysis split into three independent streams, estimate around 300 person-days, managerial synthesis for the client's board.</p> <hr/> <p>GAP ANALYSIS · WBS · PERSON-DAY ESTIMATION · REFACTORING ROADMAP · CLINICAL STANDARDIZATION</p>	<p>A.08 2026 -</p> <h3>Enterprise SaaS Integration</h3> <p>SOLUTION ARCHITECT · INTEGRATION LEAD</p> <p>Adapter layer between the client's management system and an enterprise e-learning platform. Cross-company RACI, REST APIs with token security, data seeding for legacy users. Integration pattern reusable across other providers.</p> <hr/> <p>REST APIS · TOKEN SECURITY · RACI · DATA SEEDING · EXTERNAL SYSTEM INTEGRATION</p>

§ 04 *Technology stack*

DEPTH · IN YEARS

BACKEND	Node.js · NestJS (5+) · TypeScript · Python · Django · Celery · PHP · REST · GraphQL · SOAP · WebSocket · MQTT · RabbitMQ
FRONTEND & MOBILE	React · TypeScript · Vite · React Native (iOS + Android) · HTML5 · CSS3
DATA & PERSISTENCE	PostgreSQL · TimescaleDB · MySQL · Redis · Firestore · SQLAlchemy
INFRASTRUCTURE / DEVOPS	Docker · Docker Compose · Kubernetes (on-premise) · Apache · Nginx · IIS · Firebase · GitHub · GitLab · CI/CD
AI / ML	PyTorch · TensorFlow · XGBoost · DICOM · Computer Vision · RAG · LLM Agents · Prompt Engineering
ARCHITECTURE	Event-driven · Domain-Driven Design · Microservices · Digital Twin · HLD / LLD
RISK & SAFETY	Risk register (I × P × M) · Estimates with variance · Documented assumptions · Adapter pattern · Shadow testing · Gap analysis
QUALITY & TESTING	Unit (Jest, Vitest, pytest) · Integration · E2E (Playwright, Cypress) · Code Review · GDPR · Industry 4.0

§05 *Education, languages & previous experience*

FOUNDATIONS

2021 - 2022

Bachelor's Degree in Computer Engineering (L-8)*Universitas Mercatorum, Rome* — earned in roughly 1.5 years while working full-time.

2004 - 2009

Scientific Secondary School Diploma (PNI)*Liceo Scientifico R. Canudo · Gioia del Colle, Italy.*

OCT 2017 - JUN 2020

Software Developer · Team Lead — Evolware srl*Team coordination and full-stack development of web applications with system integrations and enterprise backends.*

IT Italian — native

EN English — B2 listening · B2 speaking · B1 writing

LEGACY SKILLS

C# · ANDROID NATIVE · SAGE X3 · JQUERY ·
BOOTSTRAP 4*Maintained for legacy contexts; no longer primary technologies.*