

Enis BILICAN

7 years of experience | pro-enis@outlook.com | enis.pro/experiences

AI Solutions & Embedded Systems Engineer Smart Industry | Python | C/C++ Embedded Software | Computer Vision

Industrial AI and Embedded Systems Engineer with 7 years of experience across defence, pharmaceutical, metallurgy and manufacturing environments. Strong background in C/C++ embedded software, Python tooling, computer vision, real-time data processing, AI-based quality monitoring and hardware/software integration. Experienced in identifying industrial pain points, translating them into practical AI use cases, developing prototypes, and integrating production-ready solutions into embedded, test, QA and operational environments. Comfortable working with engineering, production, QA, validation, vendors and business stakeholders to deliver measurable business value.

FORMAL EDUCATION

2021: Master's in engineering & Industry 4.0 – University of Lille - France

2019: Bachelor of Science in in Electronics, Electrical Energy and Automatic – University of Lille – France

TRAINING & CERTIFICATIONS

04/2025: C++ advance training

05/2024: BA5 accreditation with Volta

01/2023: AI and Deep Learning with TensorFlow 2.0 certification

01/2022: Machine Learning training

12/2021: C# Intermediate certification

11/2021: Wireshark training

11/2021: Security accreditation VOL-VCA

10/2021: TIA PORTAL certification

04/2020: Electrical accreditation B0 – H0 – H0V

EXPERTISE

- Embedded and systems software engineering
- Software engineering
- Machine vision engineering
- Vision-enabled robotics
- Industrial AI solutions and AI use case discovery
- Hardware/software integration with cameras, sensors, LiDAR and microcontrollers
- Devices communications systems
- IIoT communication
- Data processing, automation and data pipelines
- Cryptography & Cybersecurity
- Data manipulation and processing
- Energy systems optimizations
- LLM-assisted workflows, documentation support and knowledge management
- Test, validation and production support environments

TECHNICAL KNOWLEDGE

Programming

C/C++, Python, Bash, C#, .NET, Qt, Boost, Flask, Dash, PyQt5, SH, JAVA for ANDROID

AI / MACHINE LEARNING / LLM TOOLS

PyTorch, TensorFlow, OpenCV, ChatGPT, Copilot, AI workflow automation, AI agents, hyperparameter tuning, dataset preparation, data annotation, computer vision, defect detection, anomaly detection

EMBEDDED / INDUSTRIAL SYSTEMS

Linux embedded, Yocto, SCADE Suite, SCADE Display, SCADE Test, microcontrollers, Arduino C, hardware debugging, HMI, test environments

COMMUNICATION & DATA

TCP/IP, MQTT, REST APIs, BLE, LoRaWAN, Z-Wave, Wireshark, MySQL, PostgreSQL, InfluxDB, data pipelines, data retention, data processing

INDUSTRIAL METHODS

UAT, IQ/OQ/PQ, GMP, validation protocols, root cause analysis, Six Sigma, 5 Whys, KPI monitoring, technical documentation

FIELDS

- Pharmaceutical
- Food industry
- Defense
- Automotive R&D
- Metallurgy

SPOKEN LANGUAGES

ENGLISH: Advance

FRENCH: Mother tongue

TURKISH: Fluent

PROFESSIONAL EXPERIENCE

FN Herstal : FROM 04/2025 TO PRESENT and FROM 01/2023 TO 10/2023

EMBEDDED SOFTWARE & CRITICAL SYSTEMS ENGINEER

Context of the project :

FN Herstal is a worldly famous defense and security company. They were specialized in gun manufacturer however, today they want more innovative and complex defense system. Contribution to the software development and integration of a complex critical defense system involving embedded software, HMI, cameras, communication layers and electromechanical subsystems. The project required close collaboration with system engineers, software developers, QA and validation teams to deliver reliable software components in a constrained hardware environment.

Achievements :

Contributed to software design, C++ development, system architecture, SCADE model development, HMI implementation and embedded Linux integration. Supported the integration of software components with electromechanical systems, communication layers and validation activities.

Results :

- ✓ Created the main HMI proof of concept in C++ with Qt and contributed to the final HMI implementation with Ansys SCADE Display.
- ✓ Developed confidential C++ and Python algorithms for system configuration, communication layers and AI-assisted system functions.
- ✓ Implemented and supported communication interfaces including CAN and TCP/IP between software components and hardware subsystems.
- ✓ Worked on embedded Linux integration using Yocto and contributed to hardware/software deployment activities.
- ✓ Codevelop to AI-assisted system functions by combining embedded software, camera-based data, configuration algorithms and hardware/software integration constraints.
- ✓ Contributed to software detailed design, API understanding, functional validation and technical documentation.
- ✓ Supported QA and validation engineers during User Acceptance Testing, troubleshooting and validation activities.
- ✓ Coached developers through code review, best practices and system-level understanding.

Technical environment / methodologies:

C++, native libraries, Boost, Qt, Python, OpenCV, PyQt5, TensorFlow, Ansys SCADE Suite, SCADE Display, Yocto Linux, CAN, TCP/IP, embedded hardware integration, Scrum methodology.

HSO Geneve, Otofacto, GSK : FROM 01/2021 TO PRESENT

AI & DIGITAL TECHNOLOGIES TRAINER

Context of the project :

Design and delivery of applied training programs to help engineering, operational and business teams adopt digital technologies, AI tools, industrial vision systems and productivity workflows. The objective was to bridge the gap between advanced technologies and practical day-to-day usage.

Achievements :

Supported multiple organizations in adopting AI-based analysis systems, industrial vision tools and productivity workflows. Trained engineers, project managers and administrative teams on AI tools, ChatGPT, Copilot, Microsoft 365 and automation-oriented methods, with a focus on practical implementation and measurable efficiency gains.

Highlighted Trainings :

- ✓ Industrial Vision Systems: Trained 25 professionals including managers, engineers and quality leads on fundamentals, algorithm optimization and troubleshooting.
- ✓ AI for Visual Defect Detection: Coached 12 pharmaceutical engineers on ML model development, testing and deployment logic for quality control.
- ✓ Trained HR, administrative and operational teams on LLM-assisted agent workflows using ChatGPT and Copilot for AI-assisted automation, documentation support, data analysis, task automation and daily workflow optimization.
- ✓ Project Management & Microsoft 365: Delivered advanced training for engineers on planning, monitoring, collaboration and Copilot-assisted productivity.
- ✓ AI-Enabled Machine Implementation: Delivered a 3-day international training for 21 engineers and regulatory managers, covering technical integration, IT constraints, compliance and practical deployment.

Technical environment / methodologies:

Industrial Vision: Market analysis, production line implementation.

AI Tools: Python, TensorFlow, ChatGPT, Copilot.

Productivity Tools: Excel, VBA, Project, Teams, Word, PowerPoint, Outlook, Project.

Methodology: Interactive workshops, personalized coaching, applied case studies.

TAKEDA : FROM 04/2024 TO 04/2025

AI PROJECT ENGINEER & WORKSTREAM LEAD - AUTOMATIC VISUAL INSPECTION

Context of the project :

End-to-end implementation from scratch of a complex Automatic Visual Inspection system to improve quality control for multiple biological product formats. The system involved 17 camera stations, robotic handling, AI-ready infrastructure, GPU-based processing, vision equipment and industrial IT integration to support high-precision defect detection in a regulated pharmaceutical environment.

Achievements :

Led the AI, IT and Vision workstream of the Automatic Visual Inspection (AVI) project, acting as the technical lead for requirements definition, specification writing, supplier coordination and project execution. Coordinated the integration of 17 camera stations with robotic handling, AI infrastructure, vision systems and IT architecture. Organized technical workshops, conducted supplier reviews and factory visits in Italy & France, and ensured alignment between production, QA, engineering teams, senior management, global stakeholders and machine vendors. Oversaw AI deployment requirements, data management, validation expectations, GPU infrastructure sizing, vision algorithm optimization and compliance with pharmaceutical regulations throughout the project lifecycle.

Results :

- ✓ Led the AI, IT and Vision workstream for the deployment of an Automatic Visual Inspection system across 17 camera stations with robotic integration.
- ✓ Managed the upstream project phase, including requirements collection, technical scope definition, specification writing, supplier clarification and project execution follow-up. Translated production, quality and regulatory needs into technical requirements for AI-based visual inspection and industrial data infrastructure.
- ✓ Reviewed and improved supplier vision algorithms through threshold calibration, false-positive reduction and defect detection sensitivity analysis.
- ✓ Managed the sizing and validation of GPU-based processing infrastructure for real-time AI inference and parallel image processing.
- ✓ Defined IT integration requirements including data retention, storage strategy, network routing and interoperability with manufacturing systems.
- ✓ Led the definition of defect taxonomy, inspection performance criteria and AI model evaluation logic for automatic visual inspection and defined and applied AI-based quality monitoring principles, including false-positive reduction, sensitivity improvement and inspection performance standardization.
- ✓ Coordinated workshops with production, QA, engineering teams, global management and external vendors to align implementation, validation and compliance expectations.
- ✓ Reviewed supplier technical proposals, challenged design choices, clarified open points and followed up technical actions with machine vendors and contributed to inspection method standardization and validation strategy in alignment with pharmaceutical quality requirements.

Technical environment / methodologies:

MS Project, Python, PyTorch, computer vision, AI-based visual inspection, GPU processing infrastructure, Digital Twin Visual Components 4.6, Brevetti Vision configuration, Prometheus digital twin, MS Project, pharmaceutical validation, USP <1790>.

Arcelor Mittal: FROM 10/2023 TO 04/2024

EMBEDDED SOFTWARE ENGINEER - REAL-TIME IMAGE PROCESSING & LIDAR

Context of the project:

In a context of human security and quality optimization. Development of internal machine vision and LiDAR-based solutions to improve industrial quality control, operator safety and production efficiency in metallurgy. The objective was to inspect large products directly on production lines, reduce downtime and improve measurement reliability.

Achievements:

Developed real-time image-processing and LiDAR-based software using existing 2D cameras to perform aspect and shape inspections from a distance of 5 meters. Implemented algorithms for real-time measurement of length, thickness, shape format, straightness, squareness and convexity. Developed RTSP-based image and data streaming solutions for integration with plant HMIs. Integrated and configured a LiDAR system from scratch for object recognition, shape detection and accurate dimensional measurements, while validating consistency between LiDAR and 2D camera measurements through relative error analysis.

Results:

- ✓ Developed a real-time low level RTSP video streaming server in C with GStreamer and FFmpeg to securely stream high-resolution industrial images up to 22000 × 1080 pixels.
- ✓ Built Python algorithms for straightness measurement, object detection, data merging, relative and absolute error calculation, image stitching and dynamic camera calibration.
- ✓ Developed AI feature-extraction logic from 2D images data, enabling advanced analysis of product shape, dimensional deviations and background stabilization.
- ✓ Integrated LiDAR data with 2D camera measurements to improve product shape detection, thickness estimation and quality-control precision.
- ✓ Developed C++ 3D object detection logic based on LiDAR data preprocessing and industrial sensor integration.
- ✓ Improved measurement reliability by comparing camera-based and LiDAR-based results and calculating relative errors.

Technical environment / methodologies:

C, Visual Studio, OpenCV, Boost, GStreamer, FFmpeg, Python, Git, LiDAR drivers, RTSP streaming, sensor fusion, real-time image processing.

GSK (GlaxoSmithKline) : FROM 03/2022 TO 12/2022

PROCESS & MACHINE VISION ENGINEER

Context of the project:

GSK (GlaxoSmithKline) is a leading pharmaceutical and vaccine manufacturer. Within the Filling and Visual Inspection (FVI) department, the objective was to optimize automatic visual inspection systems for syringes and vials to reduce false rejects while maintaining defect detection performance. The scope covered product defects (particles, foreign objects) and container defects (cracks, scratches, glass defects). The environment included more than 50 machine vision programs across 4 production lines operating under GMP requirements.

Achievements:

Developed, optimized and validated machine vision algorithms across 4 production lines to improve inspection reliability and production efficiency. Enhanced lighting systems, camera configurations and inspection parameters to achieve the optimal balance between sensitivity and false reject rates. Ensured the proper operation of inspection equipment from software, hardware and algorithmic perspectives while complying with GMP, hygiene and safety requirements. In parallel, launched and led a Pharma 4.0 standardization initiative aimed at harmonizing more than a decade of independently developed inspection algorithms. Conducted cross-comparisons between vaccine-specific detection methods, identified best-performing approaches and drove convergence toward standardized and optimized inspection strategies.

Results:

- ✓ Optimized lighting systems, camera settings and inspection thresholds to reduce false rejects while maintaining high defect detection performance.
- ✓ Ensured reliable operation of automatic visual inspection equipment through troubleshooting, corrective actions, preventive maintenance and close collaboration with Production, Quality Assurance and Maintenance teams.
- ✓ Led the standardization of machine vision algorithms by comparing historical detection methods, identifying best practices and promoting harmonized inspection strategies across products and production lines.
- ✓ Conducted production performance monitoring through KPI analysis, trend evaluation and continuous improvement initiatives.
- ✓ Led deviation investigations and Problem Solving Sessions (PSS) using Six Sigma methodologies, 5 Whys analysis and Root Cause Analysis to identify and eliminate recurring issues.
- ✓ Participated in continuous improvement projects including technical analysis, business case preparation, planning, implementation and performance evaluation.
- ✓ Contributed to validation and qualification activities (IQ, OQ, PQ), validation documentation and GMP-compliant operations in accordance with pharmaceutical quality standards and site safety procedures.

Technical environment / methodologies:

Python, Seidenader machine vision programming, ImageJ, VBA, Python, VMware, Six Sigma, 5 Whys, Root Cause Analysis, GMP, IQ/OQ/PQ, KPI monitoring.

AGC : FROM 10/2021 TO 02/2022

DATA POST PROCESSING ENGINEER

Context of the project:

R&D project focused on LiDAR sensor integration behind automotive windshields. The objective was to process, standardize and analyze 3D LiDAR point-cloud data to evaluate optical performance, support sensor behavior analysis and explore AI-based spatial data interpretation. This allows to model the environment accurately, which is the first step towards the development of self-driving cars.

Achievements:

Developed LiDAR data reception, parsing and post-processing algorithms with a focus on robustness, standardization and near real-time processing. Supported the integration of multiple LiDAR sensors using TCP/IP communication and AGC-specific analysis protocols. Contributed to AI-based analysis of 3D spatial data using mathematical representations of points, distances and geometric relationships within point clouds.

Results:

- ✓ Developed LiDAR data reception, parsing and standardization algorithms for automotive sensor R&D.
- ✓ Built a robust TCP/IP communication and data-processing workflow to integrate multiple LiDAR sensors into AGC analysis protocols.
- ✓ Implemented self-diagnostic logic to improve reliability in test conditions where live debugging was limited
- ✓ Created dynamic parsing procedures for point-cloud data extraction, standardized data storage and near real-time analysis.
- ✓ Developed mathematical processing algorithms for 3D point-cloud analysis, including spatial transformations, distance calculations and geometric feature extraction.
- ✓ Supported AI and deep learning experimentation on 3D LiDAR data for object characterization, point-cloud interpretation and sensor performance evaluation.
- ✓ Tested the algorithm under real conditions with different windshield glass configurations.
- ✓ Supported deep learning hyperparameter optimization for different windshield materials and sensor configurations.

Technical environment / methodologies:

C#, .NET Framework, Python, TensorFlow, Wireshark, TCP/IP communication, LiDAR software, 3D point-cloud processing, geometric analysis, spatial mathematics, deep learning, near real-time parsing.

PASQUIER : FROM 09/2020 TO 10/2021

INDUSTRIAL MACHINE VISION ENGINEER

Context of the project:

Full management and development of a new industrial vision solution prototype to guarantee the traceability and sorting of products produced through sharp real-time controls such as volume calculations and colorimetric analysis, as well as data feedback controls on the IS.

Achievements:

Designed and developed both hardware and software components of a mobile vision prototype. Translated production and quality needs into functional specifications, selected the appropriate sensing architecture and implemented algorithms for volume and color analysis. Realization of working mobile prototype for the machine vision controls that can be moved from line to line to try different product families to allow deployment on all factory lines.

Results:

- ✓ Led the design and deployment of an Industry 4.0 machine-vision solution, proposing technical improvements and alternative architectures for product traceability, sorting and quality control.
- ✓ Collaborated with Quality Assurance and Mechanical Design teams to translate operational needs into functional specifications and select the most suitable vision-system architecture.
- ✓ Developed real-time Python/C++ algorithms for 3D volumetric measurement using triangulation sensors, including point-cloud processing, dynamic adaptation to multiple product formats and reliability monitoring.
- ✓ Designed advanced color-analysis algorithms based on the CIELAB color space and DeltaE metrics to assess product cooking consistency, while optimizing lighting and environmental conditions.
- ✓ Implemented data formatting and communication workflows to exchange information between software processes and industrial databases.
- ✓ Designed and built a mobile industrial prototype integrating 3D sensors, vision hardware, processing algorithms, .NET-based HMI, electrical systems and custom mechanical housing.
- ✓ Implemented automated calibration procedures and delivered training sessions to technicians, enabling efficient adoption and long-term operation on production lines.

Technical environment / methodologies:

Python, NumPy, OpenCV, Colour-Science, C++, ImageJ, .NET HMI, 3D sensor SDK, database communication, AutoCAD electrical design.

CONNECTED AND VENTILATED MASK : FROM 10/2020 TO 04/2021

ELECTRONICS ENGINEER - EMBEDDED DESIGN & BLE COMMUNICATION

Context of the project:

Development of a connected ventilated mask prototype integrating embedded control, airflow regulation, BLE communication and Android-based monitoring.

Achievements:

Designed a first functional prototype combining a 3D-printed structure, Arduino-based embedded control, PWM fan regulation, differential pressure sensing and BLE communication with an native Android application.

Results:

- ✓ Conducted technology benchmarking and market analysis to identify existing solutions, evaluate public-market constraints and support cost-effective design decisions.
- ✓ Studied airflow behavior to ensure user comfort by avoiding imposed breathing rhythms. Developed an embedded control algorithm using a differential pressure sensor to compare internal and external mask pressure and dynamically adjust fan speed as well as opening and closing cycles.
- ✓ Optimized comfort and autonomy through energy-management strategies, battery sizing and mass-distribution analysis, including the integration of batteries with different capacities.
- ✓ Designed the mechanical structure in Autodesk Inventor for 3D printing, ensuring flexibility, user comfort and cable routing through a dedicated “spider-web” architecture while meeting functional specifications.
- ✓ Designed the electronic architecture around an Arduino Nano platform, selecting and sizing components for safe operation, integrating protection resistors and capacitors to minimize electrical disturbances and improve signal quality.
- ✓ Implemented Bluetooth Low Energy (BLE) communication between the embedded system and an Android application for configuration and monitoring.
- ✓ Developed Android application features allowing users to configure ventilation modes, switch between automatic and manual fan-speed control, and visualize operational statistics through dashboards.
- ✓ Implemented data preprocessing and feedback mechanisms within the application to support ventilation-performance analysis and energy-consumption monitoring.

Technical environment / methodologies:

Arduino C, BLE communication, Android Studio, Java, XML, PWM control, differential pressure sensor, Autodesk Inventor, 3D printing, Fritzing, electromagnetic disturbance management.

CONNECTED AND SMART HOME : FROM 10/2019 TO 06/2020

IOT APPLICATION & EMBEDDED COMMUNICATION ENGINEER

Context of the project:

Design and development of a connected smart-home ecosystem aimed at controlling household equipment through a mobile application while evaluating multiple industrial and consumer communication protocols. The project focused on interoperability between heterogeneous devices, embedded systems and cloud-connected services.

Achievements:

Designed the overall system architecture, integrating embedded controllers, wireless communication technologies and user-facing applications. Evaluated and implemented several communication protocols to ensure reliable connectivity, scalability and interoperability between devices.

Results:

- ✓ Developed a cross-platform mobile application to monitor and control connected devices from a centralized interface.
- ✓ Implemented BLE communication between embedded devices and the mobile application for local control and configuration.
- ✓ Integrated Z-Wave technology through a gateway architecture to manage smart lighting systems.
- ✓ ✓ Developed REST API interactions to exchange data between connected devices, gateways and external services.
- ✓ Implemented LoRaWAN connectivity for long-range, low-power communication scenarios.
- ✓ Configured MQTT-based messaging to enable event-driven communication and real-time device status updates.
- ✓ Designed and tested end-to-end communication workflows involving multiple protocols and heterogeneous devices.

Technical environment / methodologies:

Arduino C, WinDev, BLE, Z-Wave, REST API, LoRaWAN, MQTT, mobile application development, embedded systems, wireless communication, IoT architecture.

SMART IIOT SENSORS : FROM 10/2019 TO 01/2020

IIOT & DATA VISUALIZATION ENGINEER

Context of the project:

Development of an end-to-end Industrial IoT monitoring platform dedicated to environmental data acquisition, processing, storage and visualization. The objective was to transform raw sensor measurements into actionable insights through automated data pipelines and interactive dashboards.

Achievements:

Designed and implemented the complete data lifecycle, from sensor acquisition and preprocessing to database storage, analytics and visualization. Focused on data reliability, scalability and real-time monitoring capabilities. Establishment of 2 kinds of communication. First is server-client connection and the second is a messaging dialogue. Exploitation of data in 2 different IIOT platform for proof that data are not preformatted for specific application and easy-integrable.

Results:

- ✓ Integrated temperature and humidity sensors with a Raspberry Pi platform to create a low-cost industrial monitoring solution.
- ✓ Developed Python data-processing pipelines using NumPy and Pandas for data cleansing, aggregation and formatting.
- ✓ Implemented MQTT and REST-based communication services to support reliable data collection and transmission.
- ✓ Designed a time-series storage architecture using InfluxDB for historical analysis, trend monitoring and data retention.
- ✓ Created interactive dashboards with Dash to visualize live measurements, system status and configuration parameters.
- ✓ Implemented automated data acquisition and logging mechanisms to reduce manual intervention and improve traceability.
- ✓ Validated end-to-end data flows from sensor acquisition to visualization and reporting.

Technical environment / methodologies:

Python, NumPy, Pandas, Matplotlib, Dash, REST API, MQTT, InfluxDB, Raspberry Pi, time-series databases, data pipelines, sensor integration, Fritzing.
