Enis BILICAN

6 years of experience – enis.pro/experiences

Consultant/Engineer Industry 4.0 specialized in AI – Computer Vision – Embedded systems

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

TRAININGS & 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

- Software engineering
- Machine vision engineering
- Vision-enabled robotics
- Embedded systems
- Devices communications systems
- IIoT manufacturing systems
- Cryptography & Cybersecurity
- Data manipulation and processing
- Energy systems optimizations

TECHNICAL KNOWLEDGE

CAD
ANSYS SCADE SUITE/DISPLAY/TEST, ,AUTODESK INVENTOR, FRITZING

ELECTRONICS
POWER ELECTRONICS, ELECTROMAGNETISM, ENERGY SYSTEM OPTIMISATION

Programming
MATLAB, PYTHON (flask, dash, pytorch), C/C++, .NET, PHP + HTML, BASH

APPLICATION
MFC in C++, JAVA for ANDROID, QT with C++, Flask app, Dash & QT in Python, WinDev

AUTOMATISM
GRAFCET, LADDER

DATA MANAGMENT
MySQL (RENATIONAL DATABASE), INFLUXDB (TEMPORAL DATABASE), DATA PROCESSING & DATA OPTIMISATION

MACHINE VISION
IMAGE OPTIMISATION, FILTERING, 3D MODELING, EDGE DETECTION, COLORIMETRIC CONTROLS, REEL TIME PROCESSING , AI (Artificial Intelligence) and DL (Deep Learning)

FIELDS

- Pharmaceutical
- Food industry
- Defence
- Automotive
- 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 AND CRITICAL DEVICE 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. They engage the Otofacto delivery center, a team of 11 member that I join for the project. The main goal it the creation of IT part of a complex marine firing defense systems. With moving parts, multiple cameras for aiming and viewing, firing systems. It is about all the IT development and, the electronical adjustment of chips and the creation of the OS.

Achievements :
Execute activities for design conception (C++), global IT architecture, model development with SCADE suite and the final user HMI with SCADE Display, implementation of C++ in Linux environment, and integration of the software onto the electromechanics systems.

Results :
- ✓ Create the main user HMI POC in C++ with QT, and the real one with Ansys Scade.
- ✓ Develop specifics and confidential algorithms with C++ and python for the configuration of the system, the communications (CAN, TCP/IP), and the auto aiming powered by AI.
- ✓ Master the software detailed design and understand its role in the complete system.
- ✓ Coach other developers in the team, help on code review and best practices.
- ✓ Guide QA's and validation engineer for User Acceptance Testing (UAT).
- ✓ Help your team members to collect and design the requirements and understand the conception of the API and software design, as well as the functional validation.
- ✓ Contribute to the necessary documentation (validation & standardization).
- ✓ Respect the processes and organizational standards.
- ✓ Are an active member of your team and stimulate trust and collaboration with all stakeholders.

Technical environment / methodologies:
C++ with native libraries, boost, and QT framework. Python with OpenCV, PyQt5 and Tensorflow. Scade Suite and Scade Display for HMI and logic of the system. Yocto Linux embedded distribution OS. Hardware manipulation, SCUM methodology.

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

Trainer in Digital Technologies

Context of the project :

Design and delivery of specialized training programs to support professionals and academic audiences in mastering digital technologies (industrial vision, AI, automation, Microsoft 365, etc.). Programs tailored to participants' levels, bridging gaps between advanced tools and practical application, with attention to ethical and societal impacts.

Achievements :

I supported multiple companies in adopting digital vision tools, AI-based analysis systems, and optimized planning methods. I trained engineers, project managers, and administrators in the use of AI solutions as well as productivity tools such as Excel, Project, Teams, Word, PowerPoint, Outlook, and Copilot. I also delivered international training sessions that combined engineering, IT, and regulatory compliance.

Highlighted Trainings :

- ✓ **Industrial Vision Systems** : Trained 25 professionals (managers, engineers, quality leads) on fundamentals, algorithm optimization, and troubleshooting.
- ✓ **AI for Visual Defect Detection** : Coached 12 pharmaceutical engineers to develop, test, and deploy ML models for quality control.
- ✓ **AI for Productivity** : Guided 8 HR/admin staff in automation and data analysis for daily task optimization.
- ✓ **Project Management & Microsoft 365** : Advanced training for 10 engineers on planning, monitoring, collaboration, and AI integration (Copilot).
- ✓ **AI-Enabled Machine Implementation (Italy)** : 3 days training for 21 engineers/regulatory managers, covering technical integration, IT, and compliance.

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 – Implementation of Automatic visual inspection

Context of the project :

At Takeda Lessines, we initiated a significant project to implement Automatic Visual Inspection (AVI) systems. It composed of 17 camera station with a robot arm, AI ready. This project aimed to enhance the quality control of 10 different formats and products of liquid biological solutions based on purified IgG. The goal was to integrate advanced technologies, AI, and vision systems to ensure high precision and reliability in product inspection, in line with Takeda's commitment to innovation and quality in the pharmaceutical industry.

Achievements :

- Project Leadership: Led the AI, IT & Vision workstream of the Automatic Visual Inspection (AVI) project, coordinating 17 camera stations with robotic integration. Organized workshops and ensured compliance with pharmaceutical regulations for AI deployment.
- System Integration: Managed IT infrastructure integration, including data retention, storage, and network path routing, guaranteeing seamless interoperability with manufacturing systems.
- Algorithm: Verified and improved supplier's vision algorithms; implemented fine-tuning and threshold calibration to reduce false positives and increase defect detection sensitivity.
- Hardware Sizing: Dimensioned and validated a cluster of 17 GPU-based processors to support real-time AI inference and parallel vision processing.
- Technological Implementation: Integrate vision systems and advanced AI algorithms to detect defects and ensure the integrity of biological products. Following the development of the AI model and participate to the training. Simulated product flow with Digital Twin (Visual Components) to optimize inspection pipeline.
- Collaboration and Coordination: Worked closely with cross-functional teams including production, technical, higher management and global management, as well as external machine vendors to achieve project milestones and specifications redaction.
- Innovation in Inspection: Designed new test methods and optimized vision tools, ensuring alignment with USP <1790> and driving standardization across multiple product lines.

Results :

- ✓ Create the main user HMI POC in C++ with QT, and the final one with Ansys Scade.
- ✓ Develop specifics and confidential algorithms with C++ and python for the configuration of the system, the aiming, and the auto aiming powered by AI.
- ✓ Master the software detailed design and understand its role in the complete system.
- ✓ Coach other developers in the team, help on code review and best practices.
- ✓ Guide QA's and validation engineer for User Acceptance Testing (UAT).
- ✓ Help your team members to collect and design the requirements and understand the conception of the API and software design, as well as the functional validation.
- ✓ Contribute to the necessary documentation (validation & standardization).
- ✓ Respect the processes and organizational standards.
- ✓ Are an active member of your team and stimulate trust and collaboration with all stakeholders.

Technical environment / methodologies:

MS Project, Python, Pytorch, Digital Twin Visual component 4.6, Brevetti Vision config, Prometheus digital twin

Arcelor Mittal: FROM 10/2023 TO 04/2024

EMBEDDED SOFTWARE ENGINEER – Image processing and Lidar Expert

Context of the project:
In a context of human security and quality optimization. Arcelor Mittal, one of biggest company in metallurgy invest for internal machine vision solutions. They goals is to controls each kind of product in all production line across the world. A major part of product is more than 5/10 meters of length and need specific hardware and software develop from scratch for being controlled and reduce downtime, reworking the metal and reduce the total coast.

Achievements:
Use of existent 2D cameras for creating aspect and shape controls from 5 meters away. Measure and process in real time all algorithms like length, thickness, shape format but also straightness, squareness and convexity. Develop for sending all info and images through network with RTSP (Real Time Streaming Protocol) program to plant HMI. Integrate develop and use of a lidar from scratch for detecting the product shape with object recognition, the accurate size and thickness. Verify the coherence with the 2D measure and calculate relative errors.

Results:
- ✓ Develop RTSP (Real time Streaming Protocol) video streaming server in C++ with GStreamer for streaming in real time and securely all images capture. Use specific settings and compression for streaming images with a size of 22000*1080 pixels.
- ✓ Develop in Python control algorithms for straightness measures, object detection, data merging, relative and absolute errors calculations. Image Stitching, dynamic camera calibration and auto adjustment.
- ✓ Sensor fusion with Lidar, use Lidar in parallel for merging data for the shape detector and the straightness algorithm. The goal is to have the minimum error possible and the best precision in the quality records. Connecting the lidar, prepossessing the data and developing the 3D object detector C++. for founding products.

Technical environment / methodologies:
C++ on VS with OpenCV, Boost, GStreamer, FFmpeg,, Phyton, Git. Lidar Drivers and private software

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

PROCESS AND MACHINE VISION ENGINEER

Context of the project:
GSK (GlaxoSmithKline) is one of the largest pharmaceutical companies in vaccine era. In this context, and in FVI (filling and visual inspection) department the main goal is the optimization of machine vision algorithm in order to reduce false ejection of syringe and vial. Parallelly, increase the detection of defaults. The default could be in the product like static or moving particles, foreign objects. However, it could be in contents like cracks, glass breaks, scratches. It represents more than 50 machine vision programs and luminance consigns for more than 15 cameras in each of 4 production lines.

Achievements:
Development of many machine vision algorithms and improvement of existent ones to 4 production lines.
Improving the luminance system and adjusting the consigns for the right use between all machine vision programs.
Assure the proper function of all the systems, it is software, hardware, and the algorithms. All of these in the extreme respect of hygiene, security protocol and GMP (good manufacturing practices).
In the mission, a second goal in link with pharma4.0 was emerged. Many engineers for 12 years developed algorithms and it is chaotic now. I launched the standardization of all machine vision algorithms and cross comparison between all detection algorithms for all vaccines to applying the right one and converging all different algorithms to optimize one.

Results:
- ✓ Handling all GSK protocols and machine vision programs.
- ✓ Developing and improving the performance of automatic inspection equipment and finding solutions (Process, programming, mechanical, software).
- ✓ Assuring proper functioning of automatic visual inspection machines (corrective and preventive maintenance).
- ✓ Lead investigation in case of deviation and PSS (problem solving sessions) thanks to Six Sigma, 5 whys, Root Cause Analysis.
- ✓ Continuous improvement projects (Analysis, Business Case, scheduling, developing).
- ✓ Check the performance in production (KPI).
- ✓ Validation/qualification (IQ, OQ, PQ), writing of validation report and protocols.
- ✓ Interaction with Production, QA and Maintenance.
- ✓ Respects current good manufacturing practices (GMP).

Technical environment / methodologies:
Seidenader machine vision programming, ImageJ, VBA, Python, VMware, Six Sigma, 5 whys, Root Cause Analysis

AGC : FROM 10/2021 TO 02/2022

DATA POST PROCESSING ENGINEER

Context of the project:
AGC is one of the leading glass manufacturers in the world. In the R&D department, I worked in the automotive electronics & sensors team, with as theme the integration of Lidar sensors on windshields. The goal is to optically optimize the sensor behavior behind windshields. This allows to model the environment with 3D point clouds, which is the first step towards the development of self-driving cars.

Achievements:
Development of Lidar data reception algorithm. Processing the data for standardizing them for AGC analyze protocols. Use of this algorithm generalize and simplify the integration of much lidar who use TCP/IP network protocol. All of these with extreme reliability and near real time programming architecture.

Results:

- ✓ Handling of codes already available and adaptation of the need
- ✓ Getting started with the equipment and familiarizing with lidars parameters
- ✓ Development of the connection protocol and communication management system.
- ✓ We do not have the possibility to debug in real test phase. Program robustness and reliability are the watchwords. Implementation of a self-diagnostic system
- ✓ Create data parsing algorithm who uses real time programming with the state representation concept. Lidars returns a cloud point. Dynamic parsing of data is necessary to adapt to all sensors
- ✓ Implementation of data extraction procedures of standardized items and saving resulted parsed data
- ✓ Test of the algorithm in reel conditions and with different kinds of specific windshield glasses who was developed for that
- ✓ Future implementation of others type of communication has been anticipated by the creation of add-on functionality.
- ✓ Deep learning hyperparameter optimization for different windshields glass materials and training of the model

Technical environment / methodologies:
C# with .NET framework, PYTHON with TensorFlow, WIRESHARK for frames analyses, Specific LIDAR software

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PASQUIER : FROM 09/2020 TO 10/2021

INDUSTRIAL MACHINE VISION ENGINEER

Context of the project:
Attached to the Methods and Projects and Industrial IT department. The main theme is the 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:
Creation of all hardware and software. Development of two machine vision algorithms, the volume and colorimetric. 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:

- ✓ Managed and proposed, as a lead field engineer, modifications, and new technical alternatives for the existent vision system. It is the integration of an industry 4.0 solution for the company.
- ✓ Study of the system meeting the need in transversally with the quality assurance department and the mechanical design office to establish functional specifications and choose the system that best meets our needs.
- ✓ Create volumetric algorithm with triangulation 3D sensor who uses real time programming concept. With specific SDK, the sensor returns a point cloud, and the volumetric calculation was manually implanted. Dynamic control is necessary to adapt to all our products. Processing volume data to improve reliability of the algorithm and detect eventually problems.
- ✓ Color comparison is used to quantify the cooking of the product. Color analysis algorithm is for extremely close color shade comparison. We use CIELAB color space and color distance DeltaE for this task. Study of the different means of lighting and environmental control.
- ✓ Formatting all of data for communicate between computer processes and for sending on databases.
- ✓ Development of a prototype by dimensioning the computer hardware and programming of the processing algorithms and the factory HMI with .NET framework. We designed a mobile prototype with the creation of the box. It's on a frame and it can be moved with the help of wheels. Inside of the box, there is all the computer vision equipment connected to electrical cabinet made for the prototype.
- ✓ Implementation and management of automated calibrations and training sessions for technicians in order to democratize technology for factory staff.

Technical environment / methodologies:
PYTHON with NUMPY, OPENCV and COLOUR-SCIENCE modules, C++, IMAGEJ, AUTOCAD (electrical design)

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

ELECTRONICS ENGINEER – DESIGN AND COMMUNICATION

Context of the project:
For my end-of-study project, I had the idea of the creation of safe, connected & ventilated mask. Mask incorporates 2 PWM fans for intelligent ventilation according to a beforehand established airflow algorithm. The main goal is to avoid the fogging of the glasses that happens with standard masks.

Achievements:
First prototype for the mask, with specific 3D printed structure, the airflow algorithm and BLE communication between Arduino and the designed Android app for monitoring and adjust control parameters

Results:

- ✓ Technology watching for existing solutions.
- ✓ Air flows study for ventilation that doesn't bother the user by imposing a respiratory rate on it. This is possible with the use of a differential pressure sensor which makes it possible to compare the pressure outside the mask. We adapt in real time the ventilation speed, but also the opening and closing cycles of the fans.
- ✓ Cost study for use in a large public market and market habits.
- ✓ Optimization of comfort with energy management for regular use and management of mass distribution, especially with the serialization of batteries of different capacities.
- ✓ Mechanical design of the structure on Autodesk Inventor for 3D printing. It must meet specifications so as not to be rigid and inconvenience the user. It also serves as a cable passage with a "spider web" structure.
- ✓ Electronic design with an Arduino nano base. Adjust all electronical components for safety use with resistor. Management of electrical disturbances with the use of capacitors for having the purest signal as possible.
- ✓ Communication is allowed by Bluetooth low energy with an Android application for configuring the mask. Parameters like ventilation state or use of automatic / manual fan speed are disponible. There is data feedback in statistic forms to display in dashboard on the app. All data are preprocessed in the app to ensure performance analysis of ventilation and energy.

Technical environment / methodologies:
INVENTOR (MODELING and ANIMATING), ARDUINO (C), ANDROID STUDIO (JAVA and XML), BLE communication, 3D PRINTING, FRITZING (Design of ON-BOARD circuit), Electromagnetic disturbances

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

IT ENGINEER

Context of the project:
In the case of my studies, I made a connected system for smart home. The system brain is an Arduino nano, and we control all sensors with a designed app. The main objective is the combination of multiprotocol communication.

Achievements:
User interface for Android and iOS app for multiprotocol communication, Bluetooth between the app and microchip, Zwave between Arduino and lights, radio LoraWan for a pressure sensor and MQTT protocol for temperature sensor.

Results:

- ✓ Technology watching for existing solutions and study for adapting existent solutions to our problem.
- ✓ Development of the multiplatform application under Windev, the idea is to have a single functional code for Android and iOS. In this app we can control sensor like the opening of lights, and we receive many data like temperatures, pressure. We compare obtained data to environmental data thanks to “API Meteo” using user localization.
- ✓ Zwave is one of most popular smart home protocols. I use the mesh system for controlling equipment connecting to a bridge. Zwave is incorporating to Arduino with a module and standard library.
- ✓ For element who is out of range, LoranWan is adapted. This radio protocol uses few energies and can be used at greater distance. The integration with our system goes through a module and we can have an autonomous sensor in time.

Technical environment / methodologies:
ARDUINO (C), WINDEW, ZWAVE (API RESTFUL), LORAWAN, MQTT

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

IOT and visualization ENGINEER

Context of the project:
I made a real time IOT interface for displayed temperature and humidity data. The system use DHT sensor and network connection was manage by a microcontroller.

Achievements:
Physical and electrical connection between sensor and raspberry with security system. 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:

- ✓ Electronical assembly for reduce hardware cost and for made the smallest system. It's thought for an easy addable to existents materials. We use DTH dual humidity and temperature sensor and connect to Raspberry PI 3 which have server role. The microcontroller is connected to network with secure access.
- ✓ All data is managed in python with "numpy array". It's powerful scientific tool for data science. We arrange the data frame for create a standard in the order to share it through the internet. Each data is sent in time database to have historical in real time and backup solution.
- ✓ Development of connection, transmission, and reception algorithm in python. First way of communication is with API REST. It's traditional way to communication in internal or external network thanks to URL link. It's client-server architecture. The second way for the communication is with MQTT. It's messaging system which don't need powerful and complicated server but just a broker. We diffuse a message in a topic and much client can subscribe in the order to be notify.
- ✓ The main user interface is hosted by "Ubidots". It's IOT platform which allow fast implementation. To quarry configuration parameters, I create Dash web Interface in Python. We can see any changeset in real time with animated and friendly design.

Technical environment / methodologies:
PYTHON (NUMPY, MATPLOTLIB DASH, PANDAS modules), API RESTFUL, MQTT, INFLUXDB, MICROCONTROLLER, FRITZING (prototype of connections between all electronic components)