



Company profile

L'intelligenza artificiale (AI) è già il presente e sarà lo strumento decisivo dei prossimi 5 anni nella maggioranza dei settori industriali

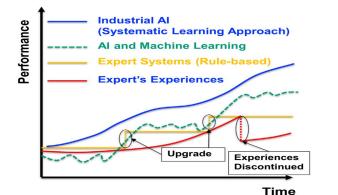


Market overview

Con più di 15 anni di esperienza in visione artificiale industriale, vogliamo dotare le aziende di sofisticate tecnologie di AI in grado di risolvere problemi ed aumentare le performance



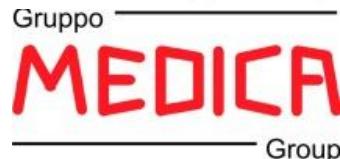
Soluzione innovativa ed efficace in un tempo ridotto
Riduzione investimenti in R&D
Innovazione



"Il successo risiede nell'avere proprio quelle competenze richieste in quell'istante."
(Henry Ford)



"Industrial Artificial Intelligence for industry 4.0-based manufacturing systems". Jay Lee, Hossein Davari, Jaskaran Singh, Vibhor Pandhare, 2018 Journal of Manufacturing Letters



Our customers



PHILIP MORRIS
INTERNATIONAL

softech - ict



hrt:::
biamp.

ICTGROUP
SOFTWARE | TECHNOLOGY | INNOVATION

crea

swisslog

Member of the KUKA Group

MONTANARI
+ ENGINEERING CONSTRUCTION s.r.l.

PRISMA

VRM



Skills and profiles



Deep learning

Classification, detection, segmentation, gan, predictive analysis,

Frameworks: Tensorflow, TensorRT, PyTorch, Digits, Ms Azure AI, ...



Advanced coding

C, C++, C#, Python, Android/Java.

Audio/video streaming:

Gstreamer, Webrtc, desktop/mobile hw encoding/decoding, encryption



Hardware technologies

.Industrial cameras: 2D matrix/linear, 3D

.Optics standard, telecentric, macro, embedded, special

.Illuminators

.Optical filters

Computer vision

*Inspections, measurements, detections
OpenCv, Halcon, NI Vision Assistant*



Edge computing

Raspberry Up, Nvidia Jetson (Tx2, Xavier, Nano, ...)



Job functions

*Data science
CV Engineer
Data Engineer
Data analyst*





Contacts



Rudy Melli

melli@vision-e.it

Tel. +39 338 4580027

www.vision-e.it

Vision-e S.r.l.

Sassuolo (MO)



Case studies

NEMOS – Nature rEserve MOnitoring System

PROBLEM: Monitoring protected areas recognizing people, animals and vehicles and its behaviour detecting intrusions into prohibited areas

- Outdoor condition, power supply often not available
- Classification “into the wild”
- Working without cloud
- Discern between type of animals and vehicles
- Tracking trajectories

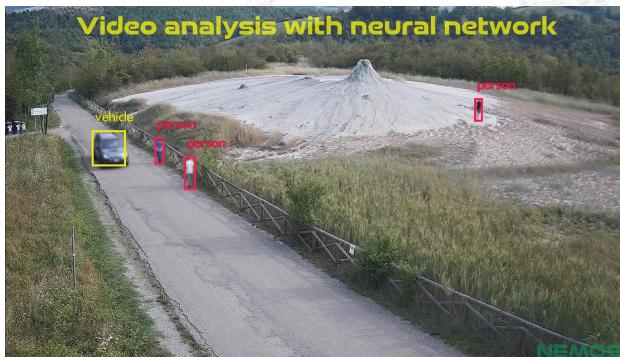
SOLUTION: Deep Neural Networks on embedded device and low power camera made it possible to detect targets without using Cloud Processing

- Real-time solution
- Detection of all classes and position of all objects
- Local computation of the data → AI at the edge → No image stored!
- Heatmaps
- Detection of intrusions
- Counting and directions
- Optional timelapse for research purpose in a non public area
- Solar panel power supply

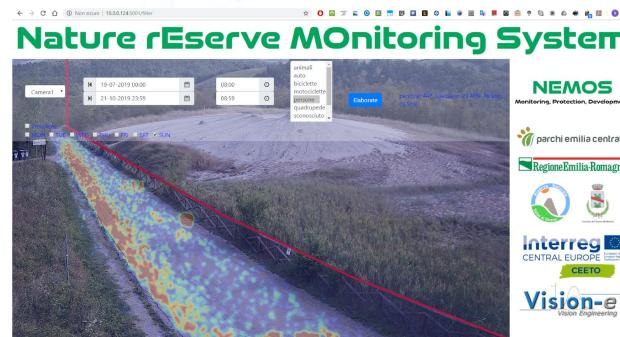
TECHNOLOGIES: Deep learning, computer vision

CUSTOMER AND PARTNERS: Ente Parchi Emilia Centrale, CEETO, Regione Emilia Romagna, Comune di Fiorano

NEMOS example



Nature rEserve MOnitoring System



19-07-2019 00:00
21-10-2019 23:59

08:00
08:59

animal
bicyclette
automobile
person
quadrupe
scooter

Detections

NEMOS
Monitoring, Protection, Development

parchi emilia centrale
Regione Emilia Romagna
Interreg CENTRAL EUROPE
CELESTO
Vision-e
Vision Engineering

Youtube video: https://www.youtube.com/watch?v=6mbOOV_c0FI&feature=youtu.be

Classification of hundreds objects

PROBLEM: Identify single object in a set of metal objects with pronounced similarities

- More objects differ in small dimensional differences
- Color, shape and size are not enough for identification
- Ease of error or incorrect classification
- Prevent false classifications

SOLUTION: Fusing traditional Computer vision and various Deep Neural Networks made it possible to achieve a correct classification

- Real-time solution
- Detection of multiple objects in front of the camera
- 99.7% of correct classification
- Few cases of “Not classified”

TECHNOLOGIES: Deep learning, computer vision

Deep Inspector

PROBLEM: Defect detection without develop a specific algorithm for each defects

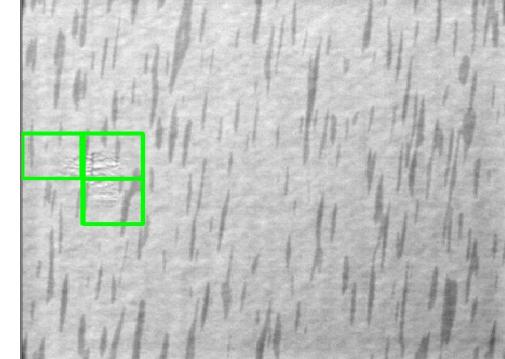
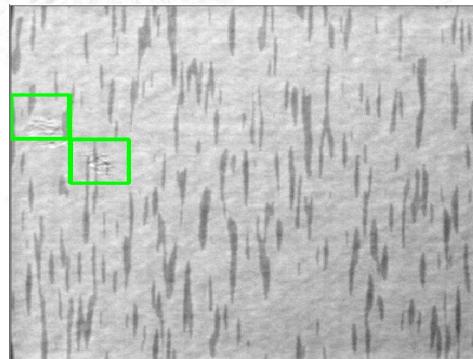
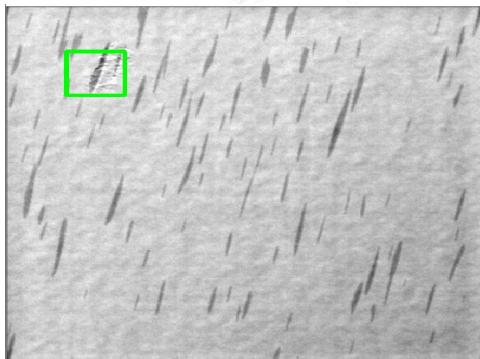
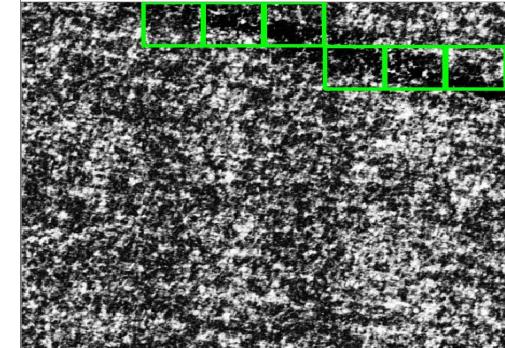
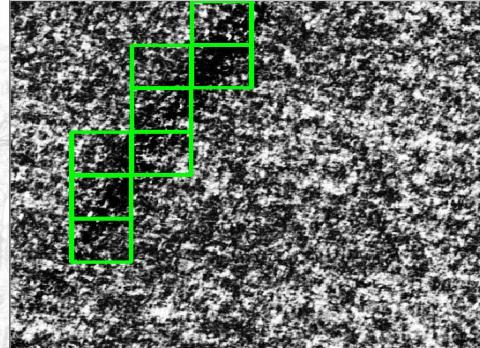
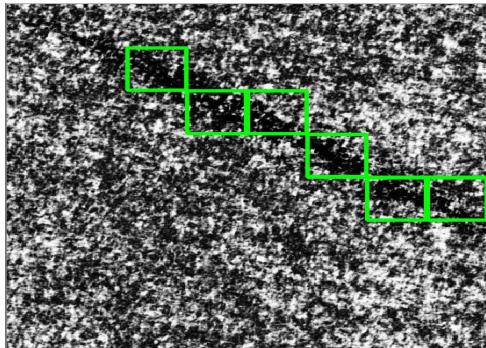
- Few examples of defects
- Not all defects are categorized
- Need solution ready to use

SOLUTION: Automatic defects localization with generic AI algorithm based on anomaly detection

- The network learns how a compliant product should be
- Detect anomaly or irregularity
- Normal irregularity of the product is filtered
- Less sensitive to light changes

TECHNOLOGIES: Deep learning, computer vision

Examples of use of Deep Inspector on texture



Speaking recognition

PROBLEM: Identify which person are speaking during a video conference call in order to zoom to focus video on his face zoomed

- Video quality is often low (webcam)
- Into the wild conditions → No control on light and background conditions

SOLUTION: Deep Neural Network and computer vision algorithm analize, for each face, detect mouth and calculate when it's moving

- Real-time solution, very fast, suitable for embedded devices
- Stable
- False positive filtering

TECHNOLOGIES: Deep learning, computer vision

CUSTOMER: HRT Srl



VEMicrometer

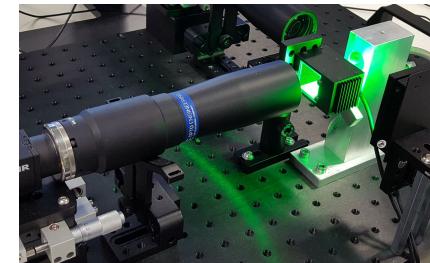
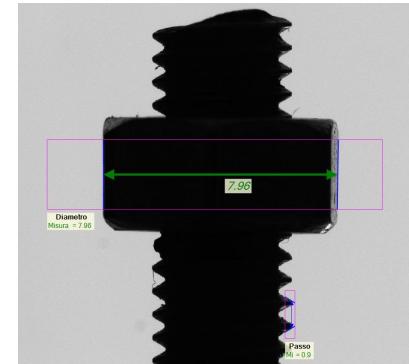
PROBLEM: Measure little parts with high accuracy

- Repeatability
- Measure more than one details at same time

SOLUTION: VEMicrometer

- Up to 2 point of view to measure at same time
- 10um of accuracy
- High repeatability
- Automatic virtual calipers
- Several measure at same time
- Measure program to save and restore
- HMI easy to use
- Measures in real time

TECHNOLOGIES: Computer vision, Telecentricity



SlomoPRO

PROBLEM: In a high speed sport event, slowmotion video proof can help referee to judge

- High performance slowmotion ($\geq 120\text{fps}$)
- Slowmotion event can start **at any moment** and must to show also some second **before** event occur → capture at high framerate for all sport session
- Slomotion video must be ready in few seconds
- Professional tools (used during TV events) costs are not accessible for minor sports leagues

SOLUTION: SlomoPRO

- 160fps at 1080p resolution and **250fps** at 720p resolution
- Extremely optimized and ready
- Slomotion video processing take only few seconds
- Feasible cost for minor sports leagues
- Works on laptop

TECHNOLOGIES: Multithreading

CUSTOMER: ICT Group Srl

Remote Assistance

PROBLEM: Production machines require on-site assistance from skilled technicians (ST)

- Longer recovery times
- Very expensive
- Availability of ST to transfer for days or weeks to fix problem

SOLUTION: Remoting assistance

- Smartglass on-site
 - . Video communicate with ST and to show it the problem
 - . Access to documentation and tutorial video directly from the machine
- Recordings of video during installation and testing of the plant
- Mixed reality to help local user to fix the problem
- Fast and timely interventions
- Cost reduction

TECHNOLOGIES: WebRtc, Android, smartglass,
Django-rest

CUSTOMER: SPIN Srl



Machine Vision projects

- Leather defects inspection system to detect wrinkles, cuts, stains, scars, ...
- Vision system for drug blister scanning and serialization by cutting with an anthropomorphic robot
- Machine vision systems for defect detection in biomedical product: blackheads, occlusions, spots,
- Machine vision for non contact high accuracy measurements
- Location and dimensional measurement of pallets
- Machine vision system for large format tiles inspection
- Machine vision system for food's packaging defects detection
- ...