Ribinerf
Nondeterministic Robotic Solutions

Made in EU:

Nondeterministic Robotic Solutions

1 Who we are

1
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3
4

We are a second generation family business, since 1986 we have been leaders in technologically advanced solutions. From automation, through artificial vision technology until now, become manufacturers of robotic machinery, we have specialized in non-deterministic scenarios building standardized solutions. We are leaders in the sector.

1986 First automation projects.
1992 Creation of Ribinerf, oriented towards machine visión.
2000 Machine vision for robot guidance.
2012 Development and building of the first robotic cell with guidance function integrated.
2013 Fusion between the automation and vision activities, turning us into a company focused on non-deterministic robot solutions.

2 Our Vision

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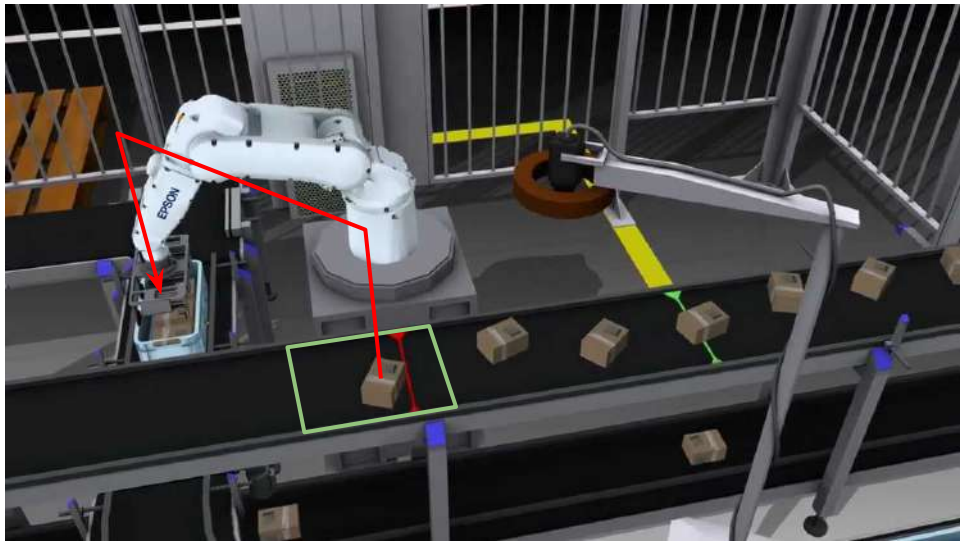
Until now, robotics has always worked inside deterministic scenarios.

All the movements, path… are determined and fixed.

This has limited the performances of the solutions, forcing an ordered sequence when handling objects with a robot.

It has been slightly improved with the adoption of the 2D and 3D localization systems but without avoiding the boundaries of deterministic scenario.



2 Our Vision

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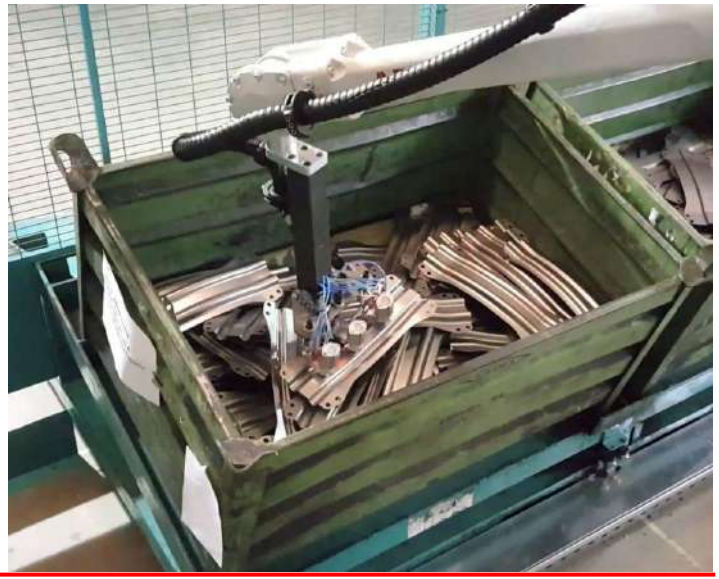
In order to work with parts that are transported in a chaotic disposition inside a container, the robot must be able to work within a non deterministic scenario, with a freedom that tends to the human capacity. It must have the ability to decide paths and pickup points in order to be as performing as a human

Our solutions, using virtual reality technology combined with AI (Artificial Intelligence), have the ability to make decisions. By implementing this new technology in the world of industrial robotics, it opens up a new range of possibilities limited until now to people.

Implementing this new work philosophy, opening up a whole new range of possibilities, that until now, only a human can be done.



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S O L U T I O N S

Virtual Reality 3D Scanner

VISIO NERF

Tailored Adjustment

Scanner model	Cirrus150	Cirrus300	Cirrus600	Cirrus800	Cirrus1200	Cirrus 1600
Scan volume (mm) (LxWxH)	150x150x50	300x300x120	600x500x300	800x600x500	1200x1000x1000	1600x1200x1200
Minium working distance (mm)	300	450	950	1250	1900	2500
Image resolution (mm) (Z)	0,1	0,2	0,45	0,9	1,5	1,8
Header dimensions (mm) (LxWxH)	312x100x210	312x100x210	412x100x210	412x100x210	612x100x210	812x100x210
Header Weight (Kg)	6	6	7	7	8	10
IP protection	65	65	65	65	65	65

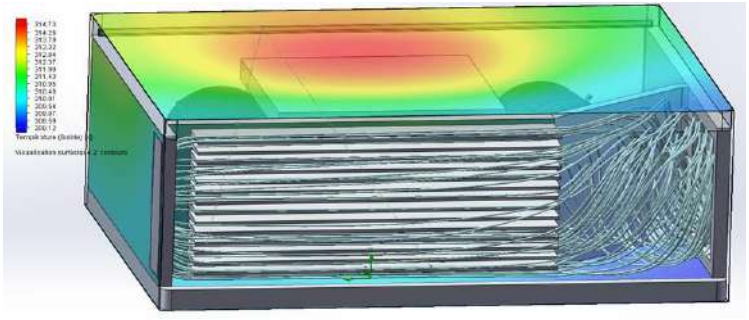
Features common to all models	
Scan speed (Minimum)	0,5 seg
Average nº of scanned 3D points	Up to 6 Milion 3D points per scan
Calibration	Factory calibrated
Material of construction	Anodized Aluminium
Connections	Power, Digital IO, VGA, Ethernet RJ45, USB
Power	24 V DC 8A max
Projector light source	LED
Temperature working range	0°C…50°C

P1.1
Catalog

P1.2
StartGuide

P1: CIRRUS 3D Scanner

- Integrated cooling system with an IP65 protection degree.
- Light source: LED, Safety.
- Computer and software integrated inside the unique housing.
- Remote access through Ethernet / Internet.

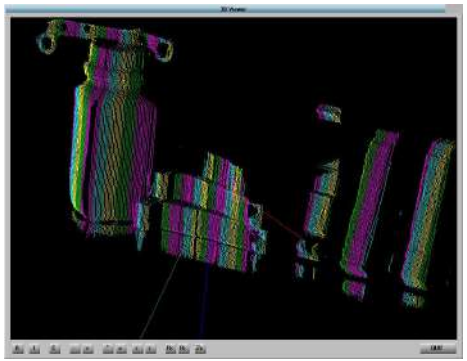


P1: CIRRUS 3D Scanner

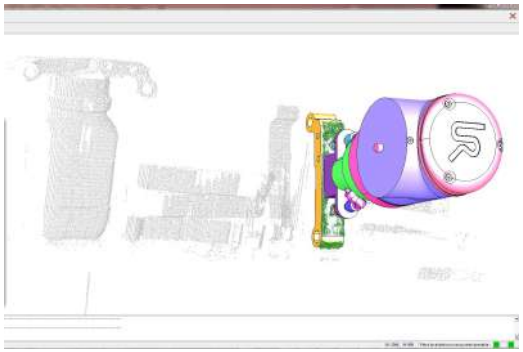
Scanning system robust against ambient lighting.

1- Scene.

2- Scanned 3D image.



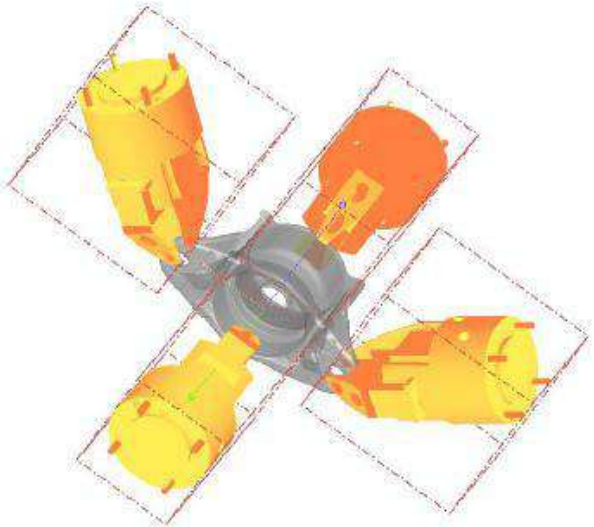
3- Cloud of points and localisation.

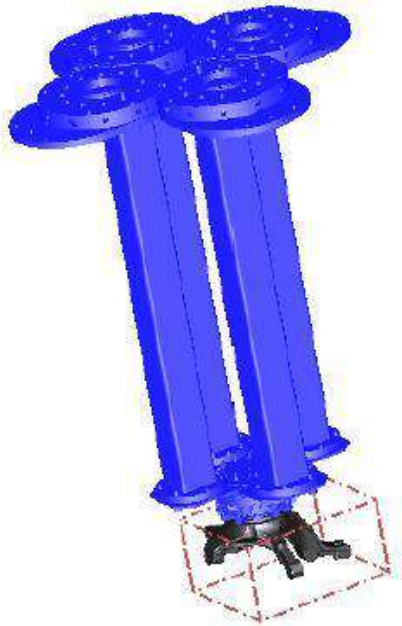


1 2 3

MULTI GRIPPING:

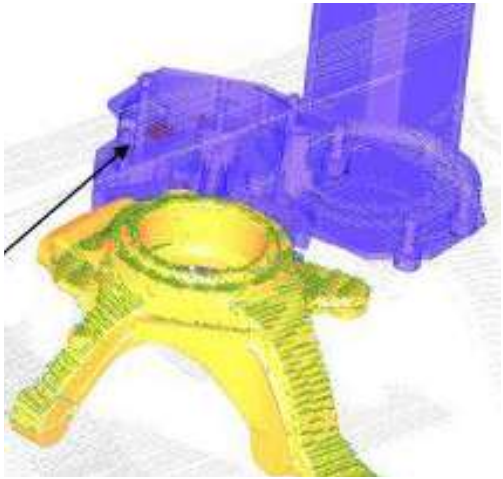
The solution enables the programmation and recognition of up to 32 gripping points, in order to optimize the gripping step.

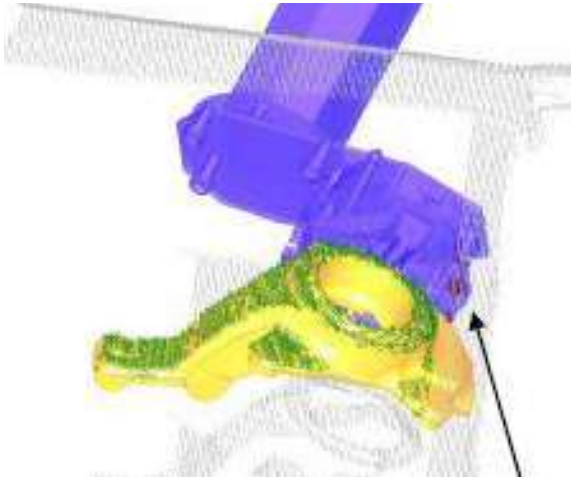


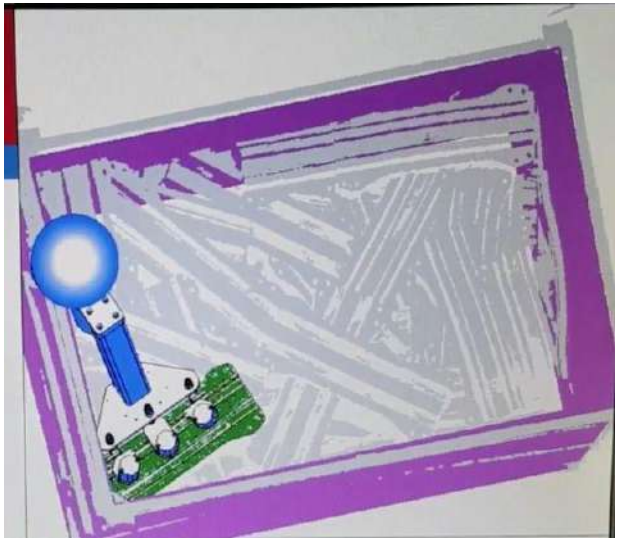


COLLISION Check:

Generation of a virtual scenario, in order to detect if the gripper can reach a part without any collision with the scanned objects (containers, parts ...) whatever the type, shape or deformation of the container is. The system will be able to locate and pick a part.

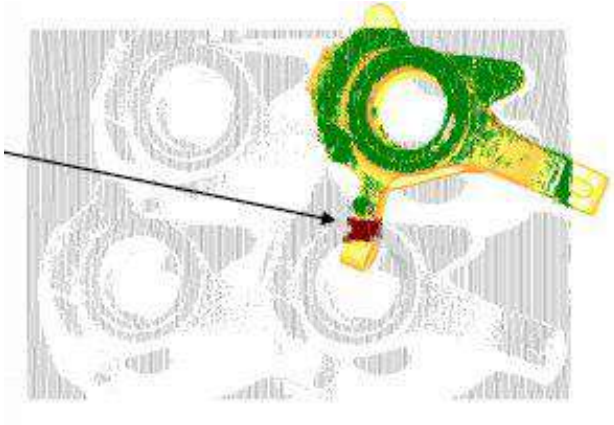


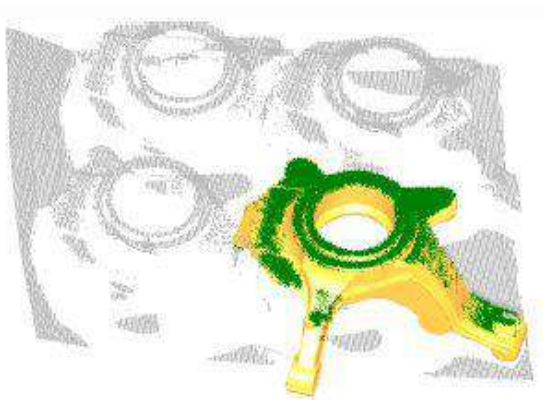




MIKADO:

The system analyzes and detects parts to check if they are overlapped. Localization of parts that are free and avoiding picking up parts which are nested.





CIRRUS CONVEYOR

VISIO NERF

The system scan a 3D Cloud of points, moving:

1. Scan up to 500 mm/sec (depending environment light)
2. Conveyor Width: Up to 1600mm
3. Scan Width: 1200 and 1600 mm
4. For analysis, system uses same Pick3D software like Static CIRRUS.

P2.5 Catalog:

P2.1 Video:

P2.2 Video:

P2.3 Video:

P2.4 Video:

Solutions for your factory

BinPicking

Pick parts randomly organized inside a container.

- Welding Cells.
- Picking parts from Bin

RackPicking

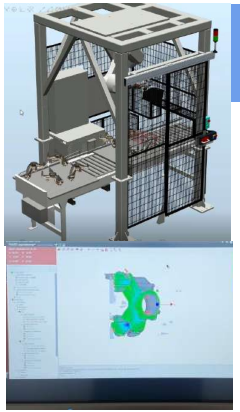
Pick up or drop off stacked or hanging parts (vertically and horizontally).

- Laser cutting CNC cells.
- Hang and unhang parts
- Hanged on Rack

ConveyorPicking

Pick up parts from conveyor and place on Bin/Rack.

- Stamping press exit.
- From conveyor to Bin / rack



Quality Control

Quality control in production.

- 3D Scanning and compare with CAO model.

A1: BinPicking Solution

- The scanner acquires a 3D point cloud of the piece, locates it, verifies that it is not too buried, verifies that there are no collisions, etc... using virtual reality.
- Immune to the color of the piece, stains, dust, oil, etc ...
- Determination of the position of the piece with 6 degrees of freedom. From the point of view of robot programming, the part is at a fixed point.
- It controls the pieces that are linked to each other, so as not to take two pieces with you.
- It has IA, in case of arriving at a scenario that there is no cogible piece, the system removes the pieces inside, in an automatic way, generating a new scenario in which new cogible pieces will appear.
- Validation of model. the pieces that are not of the programmed model, will be left in the container.

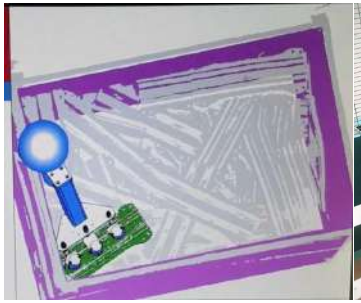
F1.1 Video

S1.1 Video

F20.1 Video

F20.2 Video

F20.3 Video



A2: Rack/Hang Solution

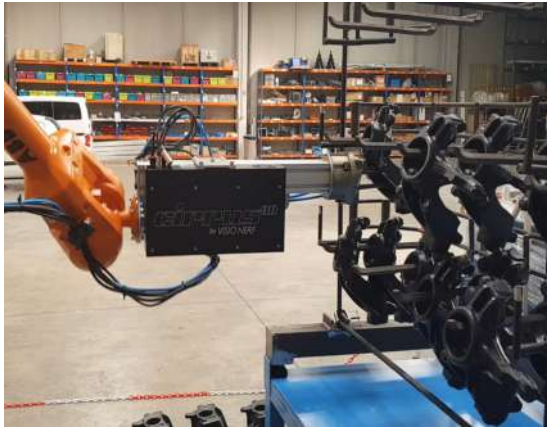
- Hanging / unhooking parts of frames or hooks that are incorrectly positioned or deformed.
- On-board robot scanner.
  - Unloading: The system locates the direct position of the part, not the support, verifies collisions.
  - Load: The system locates the physical point where the part should be left, not the complete frame, so it ignores its position or deformation.
- Multiple racks/containers for infeed and outfeed parts.

S2.1 Video

F2.1 Video

O1.1 Video

S2.5 Video



A3: ConveyorPicking Solution

- Scanner acquires the 3D cloud of points of the part, over conveyor and locates it using virtual reality.
- Robust to the color/shade or state of the conveyor belt, or type of conveyor belt. Don't need contrast.
- Robust to the color/shade of the sheet, stains, dust, oil ...
- Determination of the position of the part and it's face with 6 degrees of freedom.
- Option to pick up stacked parts.
- Part drop off in vertical or horizontal containers.
- Possibility to adjust the drop-off point to continue from the last part dropped off (typical case in column based containers).
- Possibility to determine the position of the part supports inside the container.

S3.1 Video

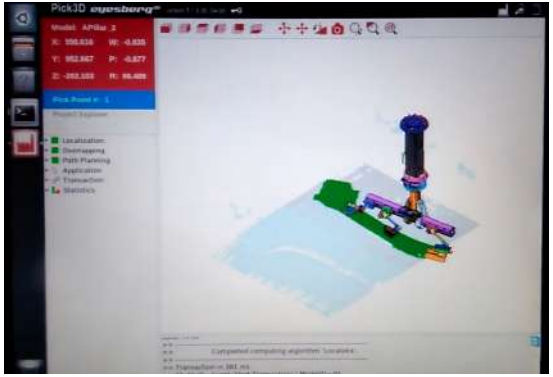
S3.2 Video

S3.3 Video

S3.4 Video

S3.5 Video

S3.6 Video



Foundry
Standard Solutions.

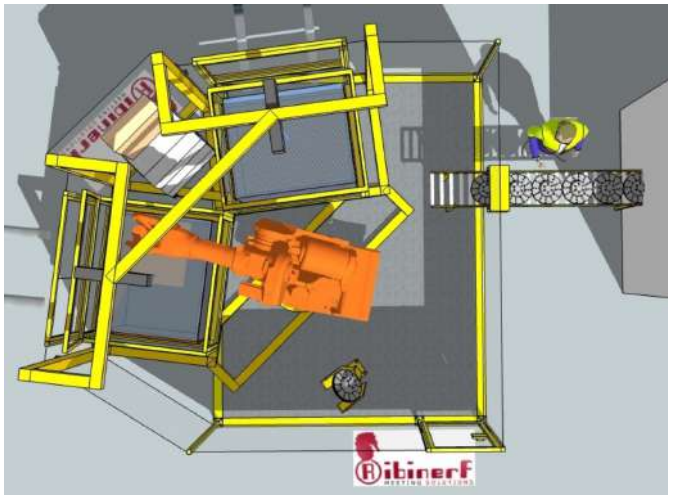
F1: Foundry: Pickup Unordered Parts from bin

Target: FOUNDRY OEM / TIER1 Automotive.
Need: Feeding from random position parts inside bin.
Solution: Portable Pickup random from Bin. Place parts same face. 30 sec/part
Parts: Foundry complex parts.
Info: Locates parts on random position inside bin.

Approx Price for 1bin: 180.000 Eur (Without Robot)
Approx Price for 2bin: 220.000 Eur (Without Robot)

F1.1 Video:

F1.2 Video:



F2: Foundry: Unhang parts

Target: FOUNDRY OEM / TIER1 Automotive.
Need: Painting process.
Solution: Unhang parts on paint output process. 7 sec/part
Parts: Foundry complex parts.
Info: Unhang: Locate the part, ignore support deformation, color, position.

F2.1 Video:

Approx Price: 320.000 Eur (Without Robot)

F3: Foundry: Hang up parts

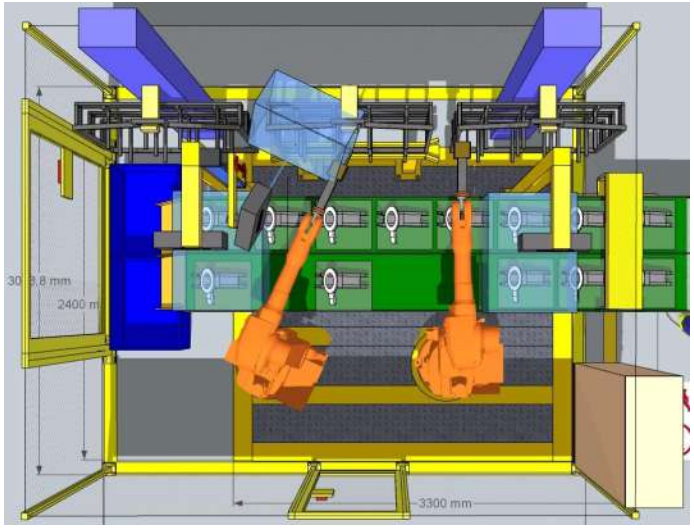
Target: FOUNDRY OEM / TIER1 Automotive.
Need: Painting process hang parts from conveyor.
Solution: Locate parts over conveyor, locate hang points on frame, pick parts from conveyor and place to frame.
Parts: Foundry complex parts.
Info: Hang up: Locate support position on space to hang up the part.

Approx Price: 360.000 Eur (Without Robots)

F3.1 Video Layout:

F3.2 Video Robot:

F3.3 Video Robot:



F4: Foundry: Pickup Parts from conveyor to Bin

Target: FOUNDRY OEM / TIER1 Automotive.
Need: Packing parts from conveyor
Solution: Pickup parts from conveyor. Place parts to Bin.
Parts: Foundry complex parts.
Info: Locates parts on random position over conveyor. Ignore background. If the parts are stacked, pickup every one without pression. Big parts. Ignore spots.

Approx Price: Depending of application.

F3.4 Video:

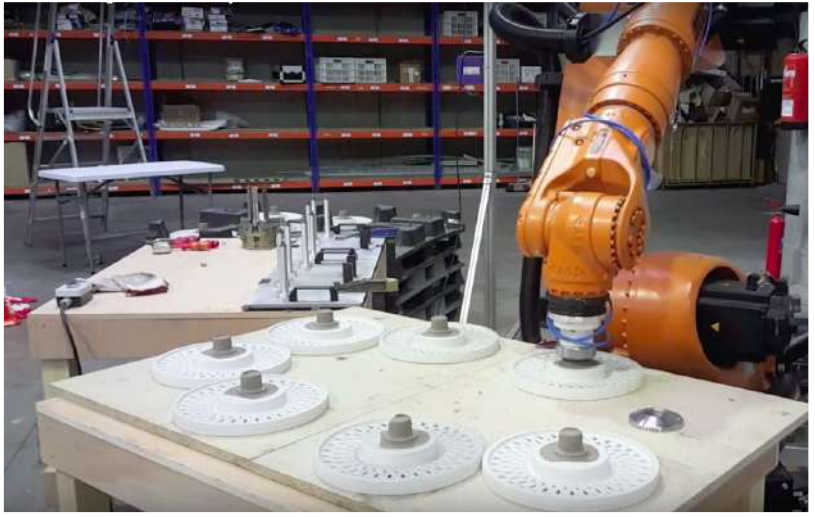
F4.1 Video:

F4.3 Video:

F5: Foundry: Pickup sand core parts

Target: FOUNDRY OEM / TIER1 Automotive.
Need: Feeding stacked core sand parts.
Solution: Pickup sand core parts from Interlayed stack.
Place parts to centered place.
Parts: Sand core foundry parts.
Info: Ignore spots, background, broked parts.
Approx Price: Depending of application

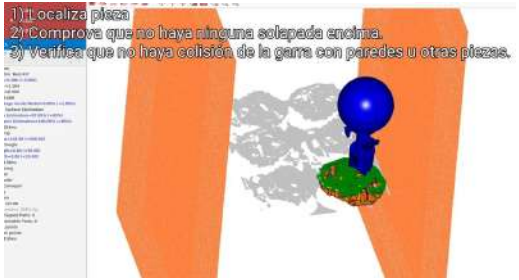
F5.1 Video:



F6: Foundry: Pickup AL foundry body motor

Target: AL FOUNDRY OEM / TIER1 Automotive.
Need: Feeding stacked Aluminium Body motor.
Solution: Pickup body motors, place on machine, take ended part to destination palet + interlayer.
Parts: Aluminium Body motor.
Info: Ignore spots, background, broked parts.
Approx Price: Depending of application

F6.1 Video:



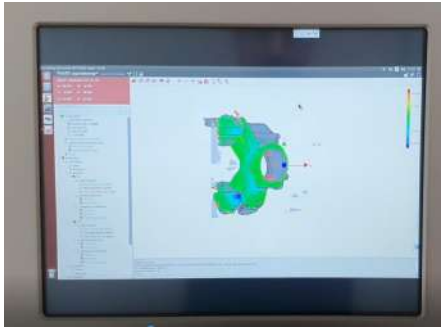
F7: Foundry: Quality Control

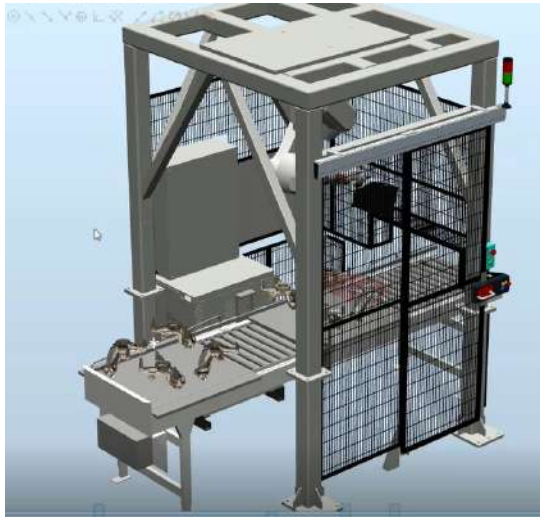
Target: FOUNDRY OEM / TIER1 Automotive.
Need: Control quality parts.
Solution: Compare part with CAD model, with a resolution and repetitivity of 0.1mm
Parts: Foundry complex parts.
Control: Lack or Excess of material, deformation.
Info: Portable machine, to install over the conveyor

Approx Price: 125.000 Eur (Without Robot)

F7.1 Video:

F7.2 Video:





STAMPING
Standard Solutions.

S1: Stamping: Feeding welding cell.

Target: STAMPING OEM / TIER1 Automotive.
Need: Feeding machines that the parts arrive unordered inside Bin.
Solution: Binpicking for feeding welding cells. 2 Loads + 1 Download each 20sec/cycle.
Parts type: random stamping parts.
Info: Low profile parts, shiny, with oil. Dynamic gripper form change to adapt every part face.

S1.1 video:

Aprox Price: 230.000Eur (without Robot)

S2: Stamping: Feeding Laser CNC Machine

Target: STAMPING OEM / TIER1 Automotive.
Need: Feeding CNC laser machine.
Solution: Pickup and Place inside Bin/Rack parts. 40 sec/cycle
Parts: Big Stamping parts.
Info: Pickup parts from origin bin/Rack, place on CNC bed. Locates destination rack to place processed parts.

Aprox Price: 230.000Eur (Without Robot)

S2.1 video

S2.2 video

S3: Stamping: From Conveyor to Bin / Rack

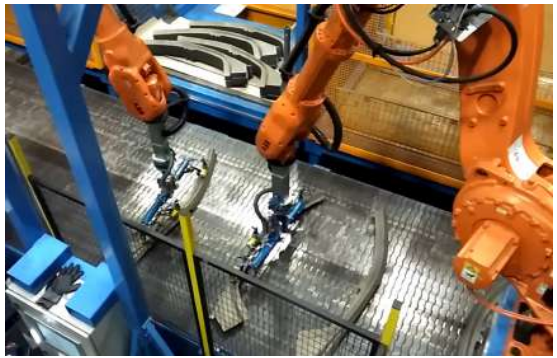
Target: STAMPING OEM / TIER1 Automotive.

Need: Place inside Bin/Rack parts parts that coming from conveyor.
Solution: Pick up hot stamping parts from conveyor belt after outside press. 10 sec/part
Parts: Stamping or hot stamping parts.
Info: Locates both hands same time. Ignore background. If the parts are stacked, pickup every one without pression. Big parts. Ignore spots.

Approx Price 2 Pick parts: 350.000 Eur (without Robots)
Approx Price 4 Pick parts: 500.000 Eur (without Robots)

S3.1 Video Pick 2 parts:

S3.2 Video Pick 4 parts:

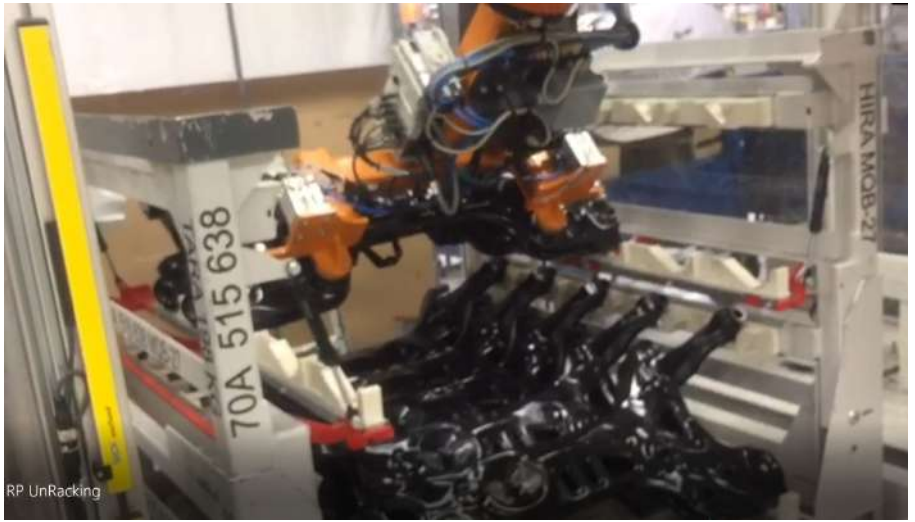


S4: Unracking.

Target: STAMPING OEM / TIER1 Automotive.
Need: UnRacking Complex parts.
Solution: Scanner Onboard, locates the part position and check Colisions.
Parts type: End Stamping complex parts.
Info: Detect colision.

Aprox Price: 180.000Eur (without Robot)

S4.1 video



S5: Rack check.

Target: OEM STAMPING / TIER1 Automotive.
Need: Verified Racks to avoid collision between parts.
Solution: 3D and VR scanning, Virtualize part entry for validation.
Type of parts: Hot/Cold Stamping.
Info: Roller conveyor model with Fenwick and OK/NOK classification and model with AGV.
Typical production: 300 containers/h

Approximate price V.C.: 245.000 Eur (Without Robot)

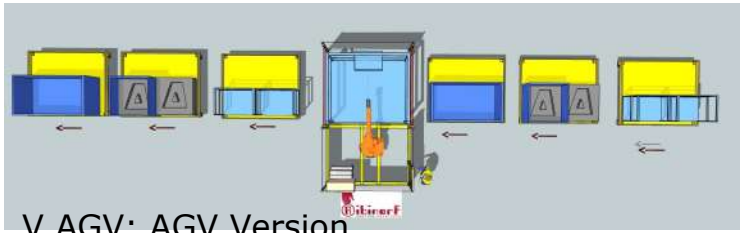
1 CAD del contenedor:

2 Zonas de interés escaneadas (puntos en Gris)

3 Comparativa de coincidencia del material real escaneado con su CAD (zona de interés)

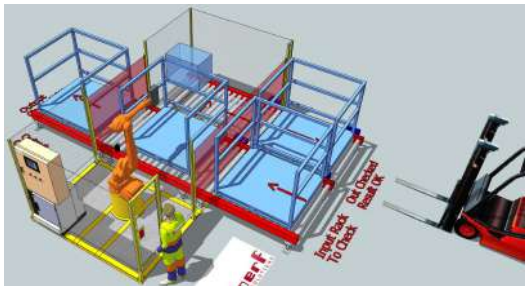
S5.1 video VC

S5.2 video V.AGV



Onboard Scanner 3D

V.C: Fenwick Version



V.AGV: AGV Version

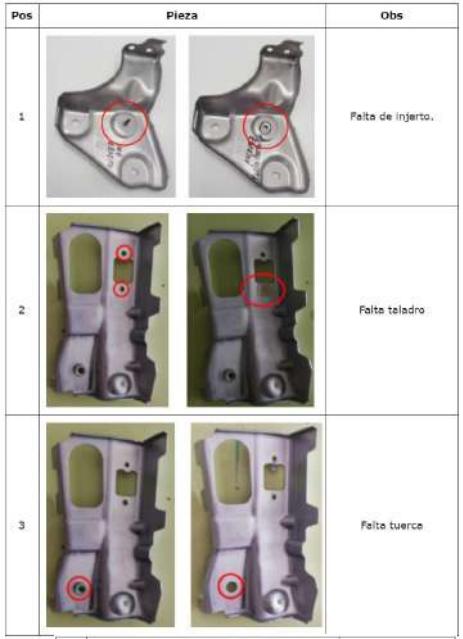
Rack check

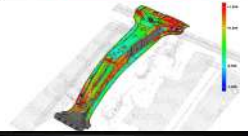
S6: PCI3D Control Calidad 3D

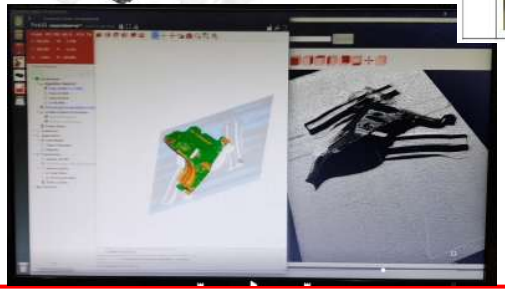
Target: OEM STAMPING / TIER1 Automotive.
Need: Quality Control of Parts.
Solution: 3D comparison of part with respect to model part. Deformations, Cracks, missing elements.
Type of parts: Stamping parts, press or welding output.

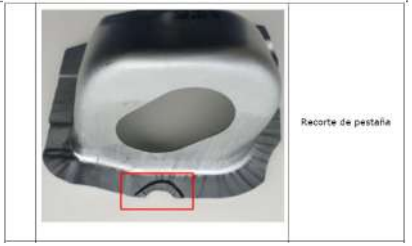
Info: Autonomous machine or prepared to be integrated in press output or welding cell.

Standard model price: 150.000Eur







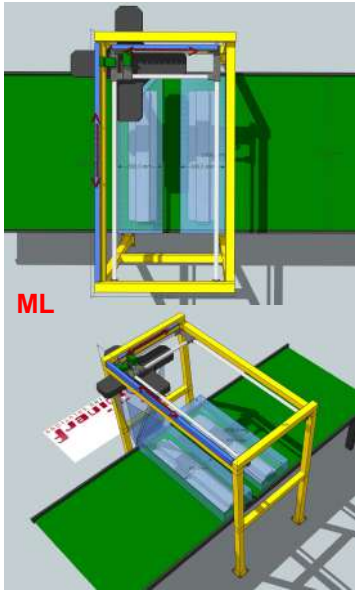


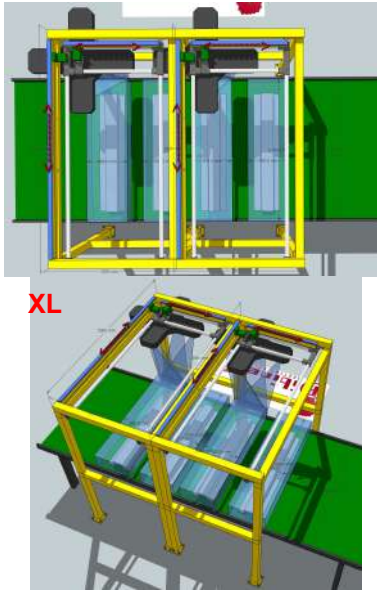
S7: PCI3DHS Hot Stamping 3D quality Control

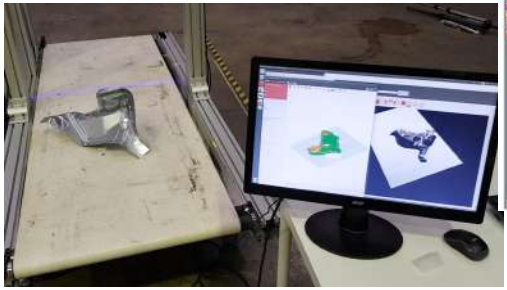
Target: OEM STAMPING / TIER1 Automotive.
Need: Quality Control of Hot Stamping Parts ML / XL.
Solution: 3D comparison of part with model part. Deformations, Cracks, missing elements.
Type of parts: Stamping parts, HS ML/XL press output.
Info: Resolution: LR model: 0,5mm / HR model: 0,2mm.

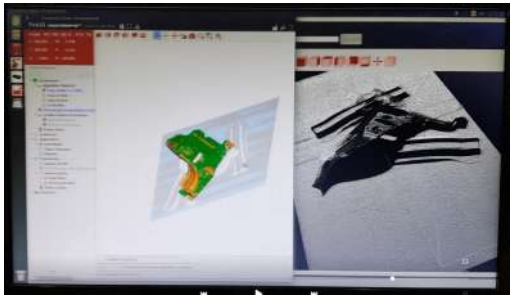
S7.1 video

Approx Price: ML LR: 150.000 Eur ML HR: 185.000 Eur
Approx Price: XL LR: 250.000 Eur XL HR: 280.000 Eur



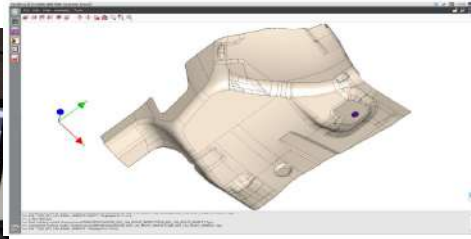




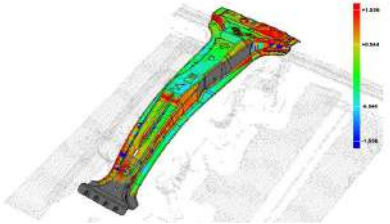


Location piece in space:

Presence of objects (punching):



Point-to-point dimensional control: (only from the points obtained in the scan) the colors on the part, indicate if the distance to the CAD or nominal model is within, above or below tolerances.



Ox: Others Standard Solutions

Another sectors
Standard Solutions.

O1: Manufacturing: Place heating car device to Rack

Target: TIER1 Automotive.
Need: Locates heating device and place to bin to exact thermoformat place.
Solution: Locate and Pickup part from cart. Locate Thermo Format print position and place part to inside.
Info: Ignore about the destination Bin: Deformation, position.

O1.1 Video:

Aprox Price: 185.000 Eur (Without Robot)

O2: Fedding elements from Bin

Target: OEM / TIER1 Automotive.
Need: Assembly process. Feeding part from bin.
Solution: Binpicking parts from 4 Bins (2 models x Double bin).
Parts: Brake disc.
Info: Pickup and center disc. Rotation reposition aligning holes. Interlayer picking.

Aprox. Price: 250.000 Eur (Without Robot)

O2.1 Video:

Nondeterministic Robotic Solutions

Thank you for your attention

Information and videos at:

www.ribinerf.com