

COMAU

COMAU

Innovation Center for Electrification

Giovanni Di Stefano



ABOUT US

Expertise in making

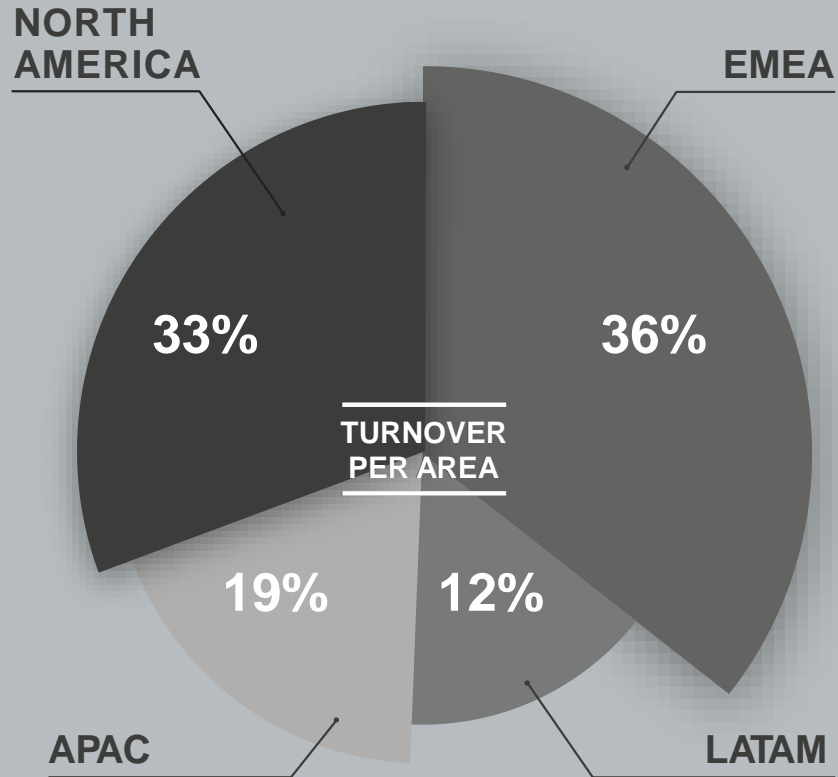
The Comau trademark is Expertise in Making: robots, automation, machines and total solutions delivered as turn-key systems.

Grounded in diverse business realities, we apply key technologies to improve time to market, optimizing capital investment.

We live by the success of our clients.



OUR KEY FIGURES



PEOPLE

9300

Employees

<40

Age Average

1800

Graduate Education +

3300

Millennials

200

Certified PMI Project Managers

>200

Electrification Specialists



ACTIVITIES
(Last 3 years)

>250

Comau #projects

>20

Comau #product launches

>150

Client #products with Comau technologies

OUR GLOBAL FOOTPRINT

14

Countries

8

Manufacturing Plants

7

Innovation Centers

5

Digital Hubs



OUR REFERENCES

Driving innovation in every area

AUTOMOTIVE



ELECTRIC VEHICLES



COMMERCIAL VEHICLES



HEAVY INDUSTRY



OTHER INDUSTRIES



ENERGY



Process Technologies for Battery Assembly

COMAU Technology Integration

LASER
SOURCE



COMAU
Lhyte

ROBOT



COMAU
NJ-Family

WELDING
HEAD



COMAU
Custom Head

PROCESS
CONTROL



COMAU
Hybrid
Thermography

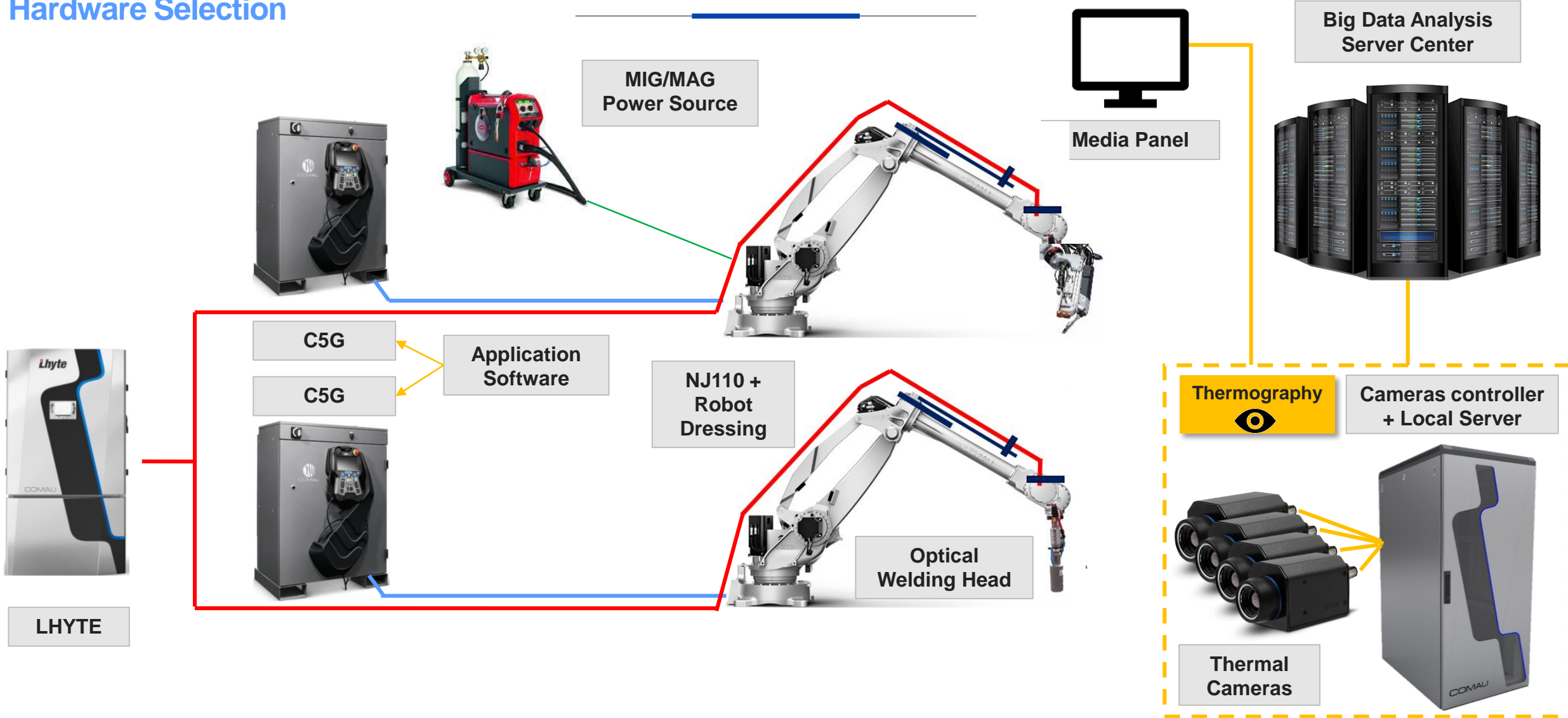
BIG DATA
PLATFORM



COMAU
In.Grid

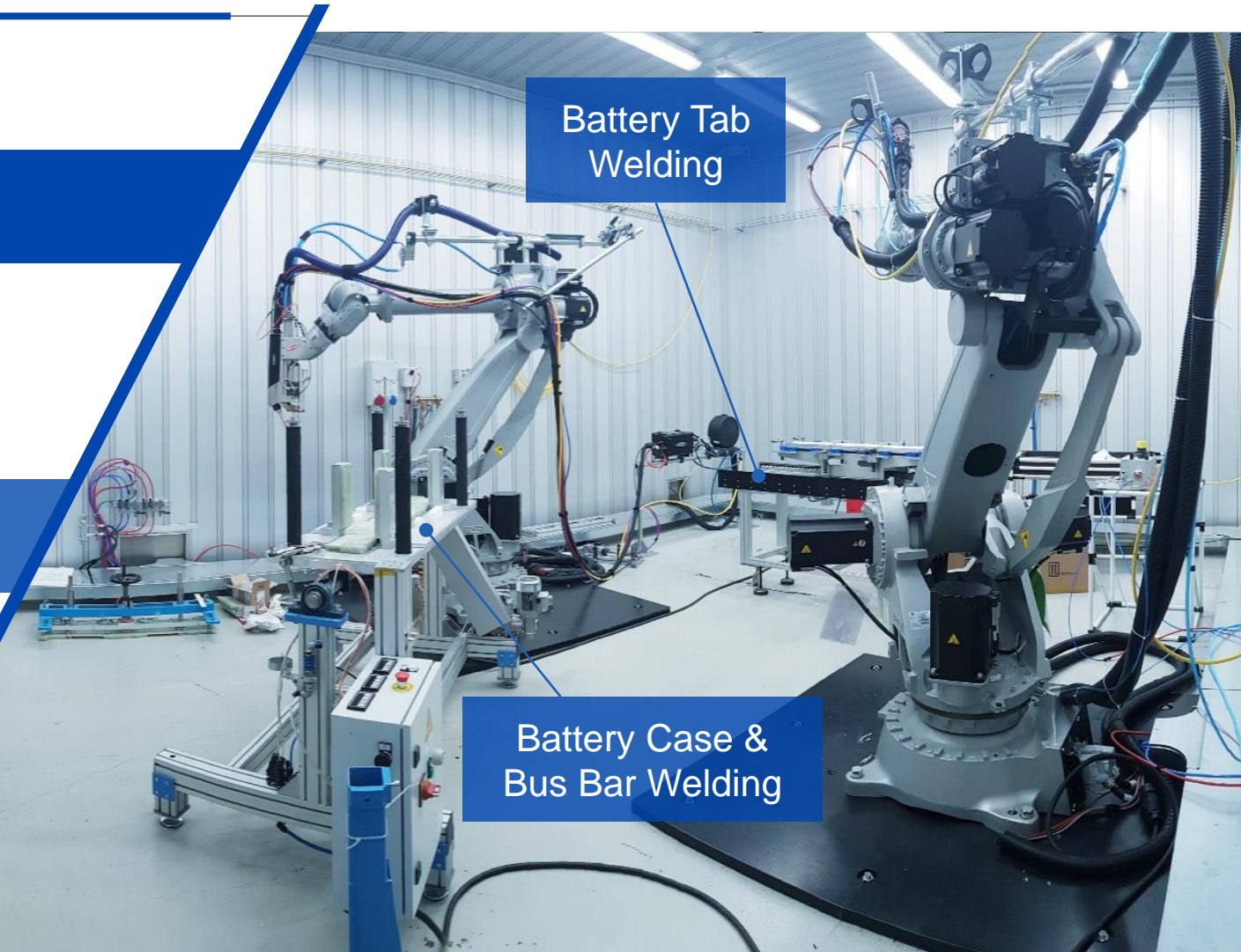
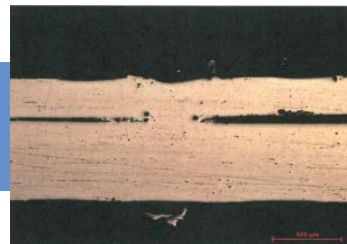
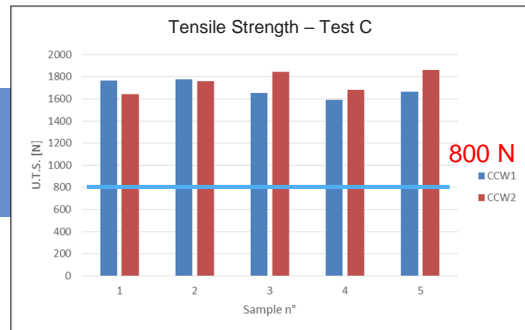
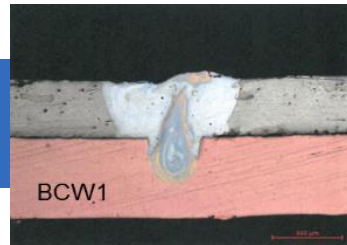
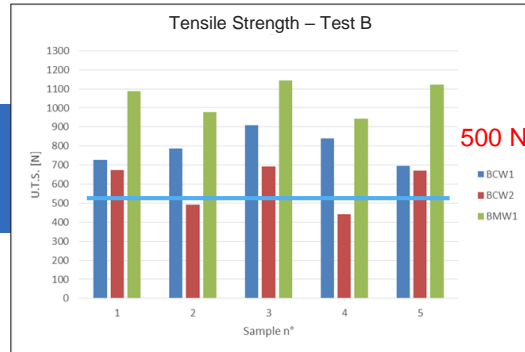
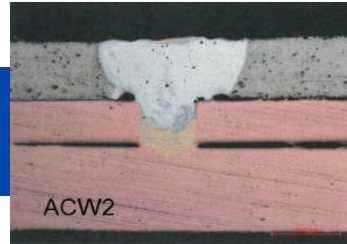
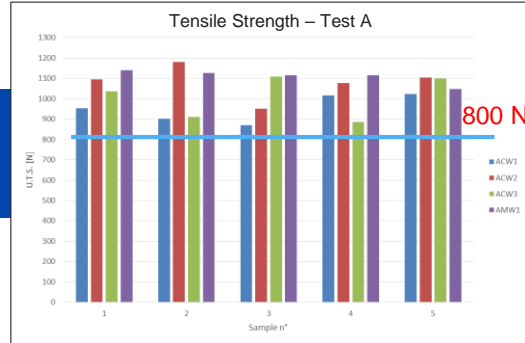
Process Technologies for Battery Assembly

Hardware Selection

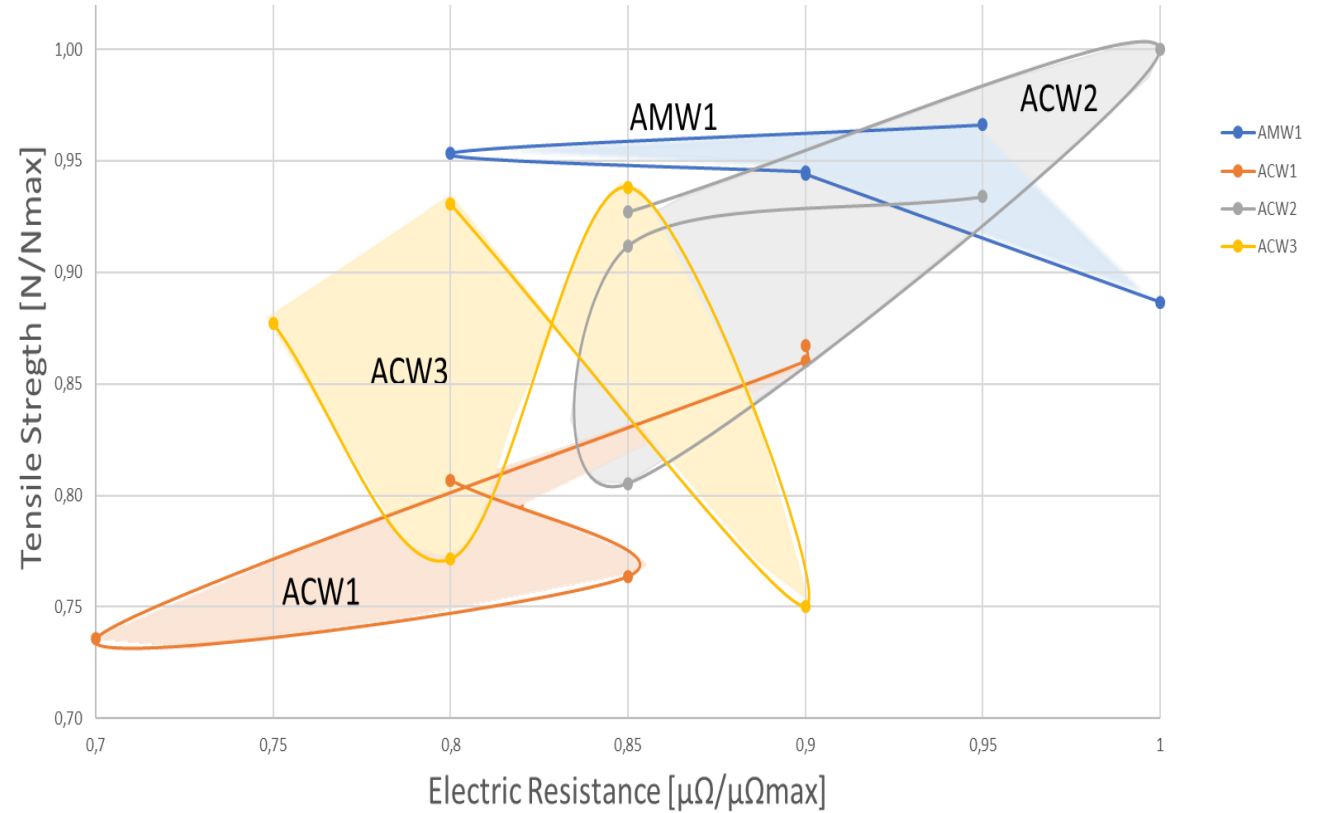
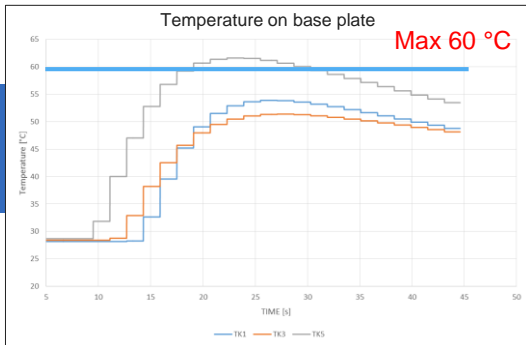
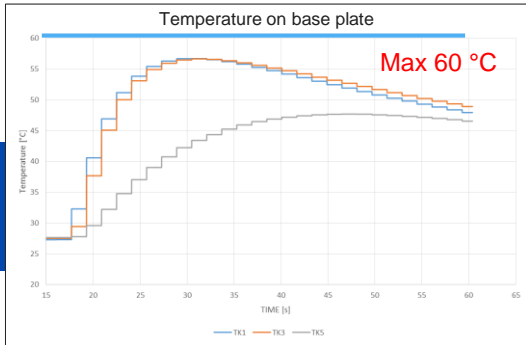


Battery Assembly Process Validation

Tab Laser Welding



Battery Assembly Process Validation



COMAU

Hybrid Thermography

Neural network welding analyzer

Giovanni Di Stefano

A customized solution starts from a watchful eye.

Discover MI.RA, the Machine Inspection and Recognition Archetypes by Comau. An intelligent, flexible and customizable industrial vision systems portfolio empowered by Artificial Neural Network.





Online



V/R System



Configuration



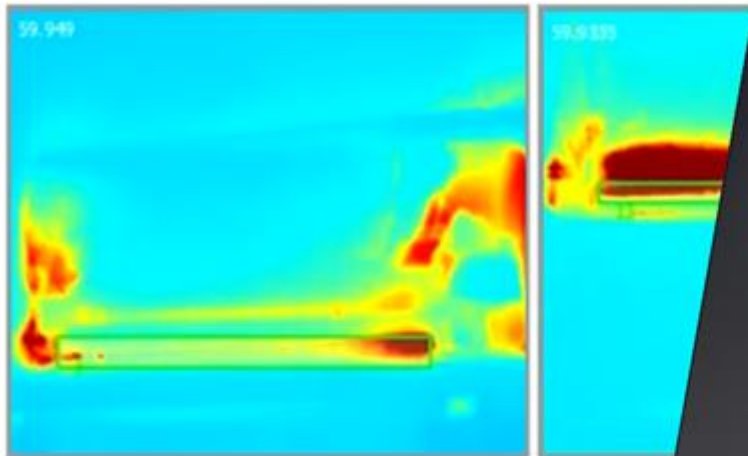
Report



Log Viewer



Settings



TC01

	ID Module	ID Weld	Desc
1	3528175620A2702L	6	Middle s
2	3528175620A2702L	13	Middle
3	3528175620A2702L	5	Middle
4	3528175620A2745L	12	Middle
5	3528175620A2745L	4	Middle
6	3528175620A2745L	11	Midd
7	3528175620A2745L	3	Mid
8	3528175620A2745L	14	Mic
9	3528175620A2745L	6	Mi
10	3528175620A2745L	10	M

Robot Connection ● Connected

<mi_ra/Thermography>

COMAU

Line
integration

IR
Acquisition

GUI

Analytics

Report

Performance



Trigger from robot or PLC

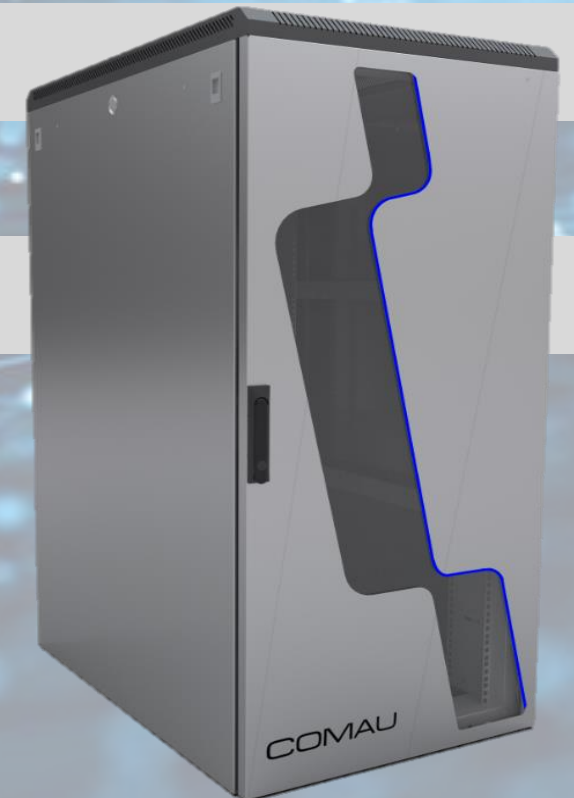


Feedback on HMI



Integration with logistic data

Hybrid thermography



Line
integration

IR
Acquisition

GUI

Analytics

Report

Performance

Hybrid thermography



Infrared military cameras



Low cost cameras



Melting pool inspection



Line
integration

IR
Acquisition

GUI

Analytics

Report

Performance

Hybrid thermography



Easy to use interface



Comau family feeling

Hybrid thermography

Line
integration

IR
Acquisition

GUI

Analytics

Report

Performance



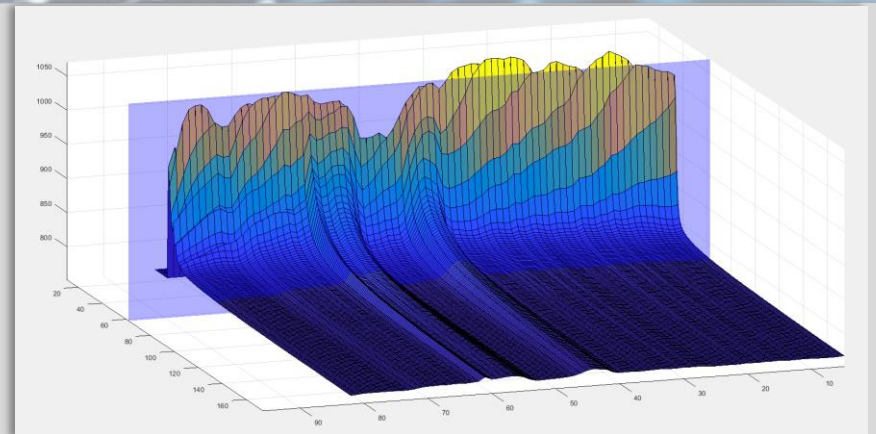
Preprocessing



Features extraction



Neural network



Hybrid thermography

Line integration

IR Acquisition



Module/Battery ID Filtering



Welding ID/Station Filtering



Feedback result filtering

GUI

Analytics

Report

Performance

The screenshot displays the COMAU software interface. At the top, it shows 'Op60A', 'DB Status', 'FTP Status', and 'SuperU superU'. Below this is a search and filter section with dropdown menus for 'Start Date', 'End Date', 'Well Status', and 'ID Weld'. A table lists acquisition data with columns for Station, Type, ID Weld, D Module/Batter, Description, Obj1, Obj2, Result, Acquisition Date, Feature1, and Feature2. A thermal image is visible on the right side of the interface.

Station	Type	ID Weld	D Module/Batter	Description	Obj1	Obj2	Result	Acquisition Date	Feature1	Feature2
1	Op60A	MODULE 011	T	Middle side-A weld 2 Cell1	Cell2	No Weld		2019-09-13 08:52:35.702	--	--
2	Op60A	MODULE 011	3528175619A10364	Middle side-A weld 2 Cell1	Cell2	Result OK		2019-10-24 09:42:03.016	--	--
3	Op60A	MODULE 011	3528175619A12211	Middle side-A weld 2 Cell1	Cell2	Result OK		2019-10-29 12:57:46.248	--	--
4	Op60A	MODULE 011	3528175619A14271	Middle side-A weld 2 Cell1	Cell2	Result OK		2019-10-25 10:16:26.060	--	--
5	Op60A	MODULE 011	3528175619A15211	Middle side-A weld 2 Cell1	Cell2	Result OK		2019-10-29 13:17:40.479	--	--
6	Op60A	MODULE 011	3528175619A15321	Middle side-A weld 2 Cell1	Cell2	Result OK		2019-10-29 14:42:57.572	--	--
7	Op60A	MODULE 011	3528175619A20008	Middle side-A weld 2 Cell1	Cell2	Result OK		2019-09-24 15:53:12.585	--	--
8	Op60A	MODULE 011	3528175619A22044	Middle side-A weld 2 Cell1	Cell2	Result OK		2019-09-19 15:46:23.114	--	--
9	Op60A	MODULE 011	3528175619A22088	Middle side-A weld 2 Cell1	Cell2	Result OK		2019-08-17 09:19:26.808	--	--
10	Op60A	MODULE 011	3528175619A22934	Middle side-A weld 2 Cell1	Cell2	Result OK		2019-09-19 15:26:29.873	--	--
11	Op60A	MODULE 011	3528175619A22944	Middle side-A weld 2 Cell1	Cell2	Result OK		2019-09-17 09:10:40.446	--	--
12	Op60A	MODULE 011	3528175619A23111	Middle side-A weld 2 Cell1	Cell2	Result OK		2019-09-24 15:56:27.804	--	--
13	Op60A	MODULE 011	3528175619A23064	Middle side-A weld 2 Cell1	Cell2	Result OK		2019-10-29 10:24:07.682	--	--
14	Op60A	MODULE 011	3528175619A23031	Middle side-A weld 2 Cell1	Cell2	Result OK		2019-10-25 09:47:26.785	--	--
15	Op60A	MODULE 011	3528175619A23041	Middle side-A weld 2 Cell1	Cell2	Result OK		2019-10-29 10:52:21.827	--	--
16	Op60A	MODULE 011	3528175619A23068	Middle side-A weld 2 Cell1	Cell2	Result OK		2019-10-24 10:03:35.081	--	--
17	Op60A	MODULE 011	3528175619A23234	Middle side-A weld 2 Cell1	Cell2	Result OK		2019-10-23 09:30:48.825	--	--
18	Op60A	MODULE 011	3528175619A23271	Middle side-A weld 2 Cell1	Cell2	Result OK		2019-10-11 10:41:11.886	--	--
19	Op60A	MODULE 011	3528175619A23228	Middle side-A weld 2 Cell1	Cell2	Result OK		2019-10-08 08:44:35.982	--	--

Line integration

IR Acquisition

GUI

Analytics

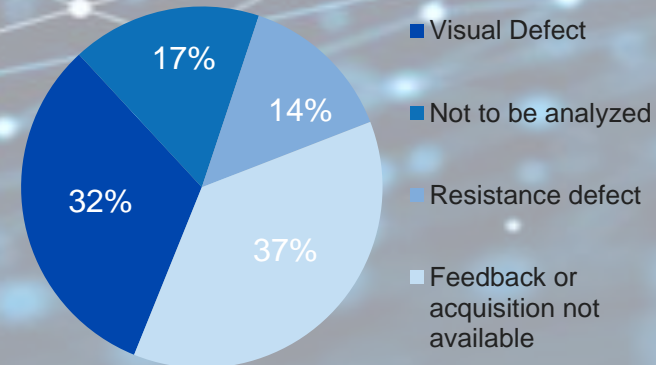
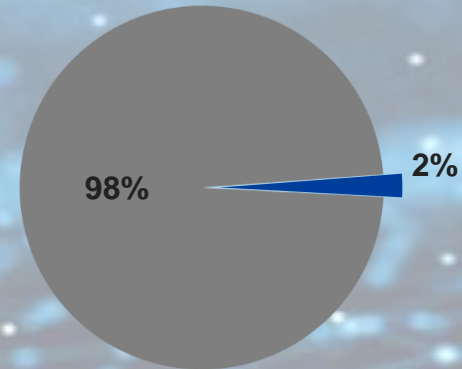
Report

Performance

Hybrid thermography

DATASET

■ No defective ■ Defective



Confusion Matrix

		Predicted Class	
		no defect	defect
Target Class	no defect	3471	241
	defect	3	46

Accuracy: 94%

Conservative approach:
prefer to predict more samples as defective

The background features a complex, abstract design. On the right side, a sphere is formed by a dense network of thin, intersecting lines, resembling a wireframe globe. Scattered across the entire light gray background are various elements: thin, curved lines that look like circuit traces or neural pathways; small, solid dark gray circles; and small, hollow white circles. The overall aesthetic is clean, technical, and futuristic.

COMAU

Motor behind imagination

A brand of **FCA**
FIAT CHRYSLER AUTOMOBILES