SIR RemanPulse

N°003

Robotics & AI for remanufacturing

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SIR — Italian Remanufacturing Society

Weekly bulletin of the Italian Remanufacturing Society

THEME: MACHINES

1 · Signal of the week

Physical AI hits the factory floor: ABB + NVIDIA close the sim-to-real gap to 99% — automated disassembly becomes economically viable

The figure: At GTC 2026 (San Jose, 16-19 March), ABB Robotics announced the integration of NVIDIA Omniverse into its RobotStudio®, with the release of **RobotStudio HyperReality** planned for the second half of 2026. The partnership closes the "sim-to-real gap" with accuracy up to **99%**, reducing commissioning time by up to **80%** and costs by up to **40%**. Two million ABB, KUKA, FANUC and YASKAWA robots are already ready for integration.

Simultaneously, Universal Robots unveiled the **UR AI Trainer** with Scale AI — the first commercial imitation learning lab-to-factory system for collaborative robots. An operator physically guides a "leader" robot; a "follower" robot replicates the movement recording synchronised motion, force and visual data to train Vision-Language-Action (VLA) models.

Why it matters for remanufacturing: Remanufacturing is characterised by high variability and uncertainty about product condition — exactly the kind of "messy" environments that Physical AI aims to solve. With an 80% reduction in setup time and 40% cost savings, automated disassembly becomes economically viable even for SME remanufacturers. Imitation learning allows a skilled technician to "teach" a robot how to disassemble a used component without code. COMAU (Turin, ROB4GREEN partner) is directly involved in the Horizon Europe ecosystem developing these technology stacks.

ABB Robotics: abb.com/global/en/news/134030 | NVIDIA Newsroom: nvidianews.nvidia.com | NVIDIA GTC Blog: blogs.nvidia.com | Universal Robots: prnewswire.com

2 · In-depth analysis

2026 overview: the key technologies transforming remanufacturing

March 2026 marks a turning point: Physical AI moves from the lab to the factory floor. Five technologies are converging to make remanufacturing automation — historically penalised by the variability of used products — both technically and economically feasible.

Physical AI and Collaborative Robotics

Physical AI — foundation models trained on synthetic and real data to understand and manipulate the physical world — is the dominant trend at GTC 2026. ABB, KUKA, FANUC and YASKAWA (combined installed base: >2 million robots) have all announced integrations with NVIDIA Omniverse and Isaac. The Industry 5.0 market will grow from $65.8 billion (2024) to **$255.7 billion by 2029** (CAGR 31.2%). According to Deloitte, 58% of business leaders already use Physical AI; the share is expected to reach 80% within 2 years. Cobot ROI in manufacturing is often under 14 months.

ABB Cobot Trends 2026: abb.com | Manufacturing Dive: manufacturingdive.com

Machine Vision for Disassembly

The global machine vision market will double from $20.4 billion (2024) to **$41.7 billion by 2030**. Over 70% of manufacturers plan to adopt AI visual inspection within 18 months. ADS (Automated Disassembly Systems) reduce processing time by at least 50%. Academic research advances with neural-symbolic reasoning frameworks enabling robots to identify and disassemble end-of-life products even in degraded conditions.

ITAD Daily: itaddaily.com | ScienceDirect: sciencedirect.com

Digital Twin

The global digital twin market exceeds **$49.5 billion in 2026**, with a CAGR of 31.1% towards $328.5 billion by 2033. The key transition: from static twins to **Executable Digital Twins (xDT)** with integrated generative AI, capable of autonomously diagnosing problems and ordering spare parts. The Digital Product Passport (mandatory under EU law from 19 July 2026) will create both an obligation and an opportunity for remanufacturers to integrate core traceability. The xDT-as-a-Service model lowers the technical barrier for SMEs.

Cloud Latitude: cloudlatitude.com | Siemens Simcenter: blogs.sw.siemens.com

Predictive Maintenance and Remaining Useful Life (RUL)

AI-driven maintenance is consolidating as an industry standard, shifting from predictive to **prescriptive**: AI autonomously generates the complete work order. Fault detection lead time: 3 to 8 weeks. Downtime reduction: from 12-18% to 3-6% (AI-driven). McKinsey estimates a 20-40% increase in machine life. For remanufacturing, RUL (Remaining Useful Life) is the key concept: knowing the residual life of a used component determines whether it can be remanufactured.

Oxmaint: oxmaint.com

Summary table — Key technologies and their impact on remanufacturing

Technology	Key figure	Remanufacturing impact
Physical AI / Cobots	Setup -80%, costs -40%	Automated disassembly becomes economically viable
Machine Vision	$41.7B market by 2030	Automated grading and quality inspection
Digital Twin (xDT)	$49.5B market in 2026	Disassembly simulation, core traceability (DPP)
Imitation Learning	UR AI Trainer (Scale AI)	Technician teaches robot without code
Pred. Maintenance / RUL	Downtime -65%, life +20-40%	Residual life estimation of cores at intake
AMMR	Cobot ROI <14 months	Flexible automation for SME remanufacturers

Investments and startups

Mind Robotics (Rivian spinout) closed a **$500 million** Series A (Accel + a16z, ~$2 billion valuation) for industrial robots with human-like dexterity. **Machina Labs** raised **$124 million** (Series C, Toyota Woven Capital and Lockheed Martin Ventures) for the first AI-driven Intelligent Factory. **Mimic Robotics** (Zurich) is among the 20 Physical AI companies to watch for dexterous manipulation — the main technical barrier to automated disassembly.

TechCrunch: techcrunch.com | Machina Labs: machinalabs.ai

Active EU projects

- **RENÉE** (EUR 7M, Horizon Europe, 2024-2027): digital twin for remanufacturing, 4 sectoral pilots, 15 partners from 9 EU countries including Italian partners.
- **ROB4GREEN** (EUR 2.4M Open Call active): AI-driven robotics for dismantling and remanufacturing. **COMAU (Turin)** direct partner. Opportunity for Italian SMEs.
- **rEUman**: human-centric remanufacturing with **Olimpia Splendid** (Italy) on heat pumps.

• **RemaNet**: 25 partners, digital platform for remanufacturing and Digital Product Passport.

RENÉE — CORDIS: cordis.europa.eu | ROB4GREEN: rob4green-project.eu | rEUman: reuman.eu

3 · Three signals

3.1 Hiro Robotics Genoa: 90 monitors/hour with ABB robots — Italian de-manufacturing already exists

Hiro Robotics (Genoa, founded 2018) has developed an automated disassembly system for WEEE using ABB IRB 2600 and IRB 460 robots, machine vision and AI. Three robotic stations process up to **90 monitors/hour**. The LaboRAEE project, at the TEIA facility (3,000 m²) in Bollate prison (Milan), trains inmates alongside robots in a social circular economy model. Hiro aims to expand to servers, telco equipment, inverters and photovoltaic panels — demonstrating that automated de-manufacturing of heterogeneous products is already operational in Italy.

ABB News: abb.com

3.2 Google DeepMind + Agile Robots: Gemini Robotics on the factory floor

Google DeepMind announced (24 March 2026) a partnership with **Agile Robots** (Munich, >20,000 robotic systems installed) to integrate **Gemini Robotics** foundation models into industrial robots. Google also brought **Intrinsic** (robotics software) back in-house, aiming to become "the Android of robotics" for manufacturing. The competition between NVIDIA and Google for AI robotics leadership accelerates model improvement and cost reduction for remanufacturers.

CNBC: cnbc.com | TechBuzz: techbuzz.ai

3.3 ROB4GREEN Open Call: EUR 2.4 million for remanufacturing SMEs

ROB4GREEN (Horizon Europe, Grant No. 101189665) has opened its first Open Call with **EUR 2.4 million** for SMEs and researchers developing AI/Robotics for: (1) life extension, (2) remanufacturing and refurbishing, (3) selective disassembly, (4) decommissioning and recycling. **COMAU (Turin)** is a direct partner with an EU contribution of EUR 465,937. A concrete and immediate opportunity for Italian remanufacturing SMEs.

ROB4GREEN: rob4green-project.eu | Open Call: rob4green-project.eu/open-calls-2/ | CORDIS: cordis.europa.eu

4 · President's view

> *"Physical AI is no longer science fiction: it is available industrial infrastructure. Italian remanufacturing has the skills to lead."*

What happened at GTC 2026 is not a technology announcement: it is a paradigm shift. ABB, KUKA, FANUC and YASKAWA — the robots already in use — now integrate on-board AI and high-fidelity digital twins. A sim-to-real gap closed to 99% means a reman plant can simulate and optimise a disassembly cell before touching a single part.

As SIR, we are uniquely positioned. Our agreements with **UniPa, UniMe, PoliBa, UniFi, PoliMi** and other universities feed the applied research these technologies require. Way Point, the company where I serve as Innovation Manager — with R&D sites in Altivole, Galati Mamertino and Palermo and an active scientific liaison with universities — is working precisely on this: bringing research into the industrial process.

EuAReman 2026 (Palermo, 7-9 October, organised by SIR with CNR-ICAR) will be the place where these convergences become concrete. I invite all members to submit abstracts by 30 May and to attend the first international Europe-Africa workshop on remanufacturing.

Alberto

President SIR — Innovation Manager Way Point | Co-chair WG Lighting ERC | Member UNI/CT 057 | LightingEurope

5 · Events and deadlines calendar

April — November 2026

Date	Event / Deadline	Type
15 Apr 2026	Horizon Europe: Robotics Platforms Call (EUR 25M) — deadline	EU call
7-13 May 2026	interpack Düsseldorf — KUKA Innovation Award finale	Trade fair / Award
30 May 2026	EuAReman 2026: abstract submission deadline	Academic deadline
30 Jul 2026	EuAReman 2026: early bird registration	Event deadline
23-29 Aug 2026	CIRP General Assembly — Turin	International conference
7-9 Oct 2026	EuAReman 2026 — Palermo (organised by SIR)	International workshop
4-6 Nov 2026	World Remanufacturing Summit 2026 — Tokyo	International summit

Next issue: RemanPulse N°004 — US | 7 April 2026

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