

Welcome to Avular



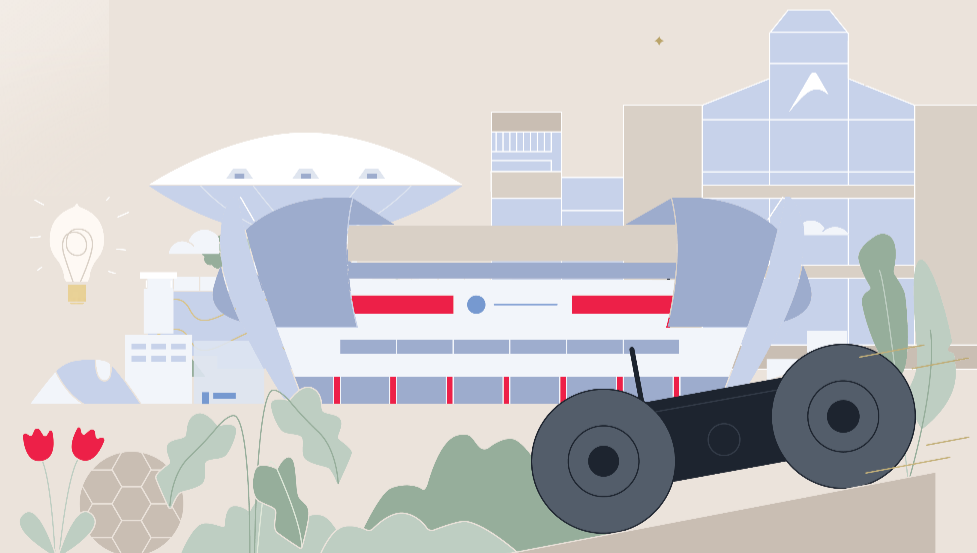
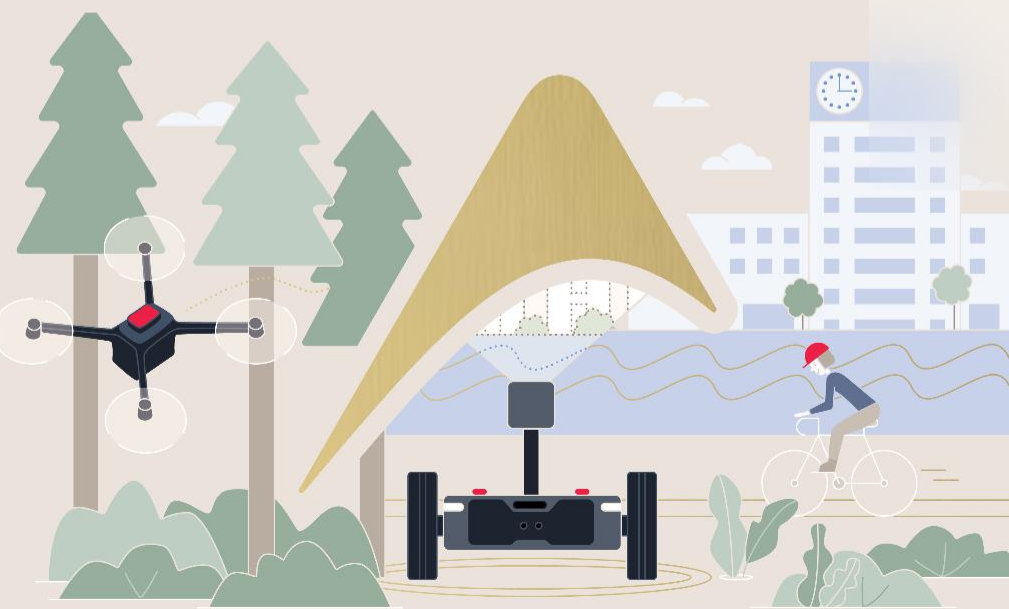


KEYNOTE · ROBOTICS & PHYSICAL AI

The next trillion is physical

What is really happening in robotics, and why Europe
cannot sit this one out.

Albert Maas | Founder & CEO, Avular | September 2026



Who is speaking



ABOUT THE SPEAKER

Albert Maas

CEO and Founder of Avular, a mobile robotics company

A strong heart for **design,**
engineering and production
, learned bench-up

Why Europe needs this robotics company, and how we build it

DRIVERS • WHAT THE MARKET ASKS OF US



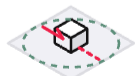
Labor shortage

Structural shortage of people in industry, care and infrastructure: one operator must run more systems.



Geopolitical tension

Europe must control critical technology itself; dependence on non-European chains is a strategic risk.



Unreliable or complex autonomous operations

Autonomy in the real field is hard: unpredictable environments demand robust, proven systems.

STRATEGY PILLARS • HOW AVULAR RESPONDS



Operator-centric design

Designed from the operator outward: easy to operate, quick to learn, reliable under pressure.



Deep vertical integration: own your IP

Our own hardware, software and autonomy: control over the whole technology stack, no black boxes.



Strong technical orchestration

Components, partners and production tightly aligned: from building block to integrated system.



Two ways to market, one stack

Business unit 1



01 • END-USER PRODUCTS

Our own drones and ground robots, sold and supported by us.



Business unit 2



02 • APPLIED AUTONOMY • CO-CREATION

Partners bring the domain and the market; we bring the autonomy.



The Avular Autonomy Stack

Robotic software building blocks

Perception

Sensor fusion

Object detection

Path planning

Obstacle avoidance

Motion control

Mission planning

Safety layer

Knowledge base

Simulation

Digital twin



BUSINESS UNIT 01 · OWN PRODUCT

Vertex One

High-end multicopter drone, fully developed and produced in the Netherlands. Modular, programmable and built on the same autonomy stack as our ground robots.

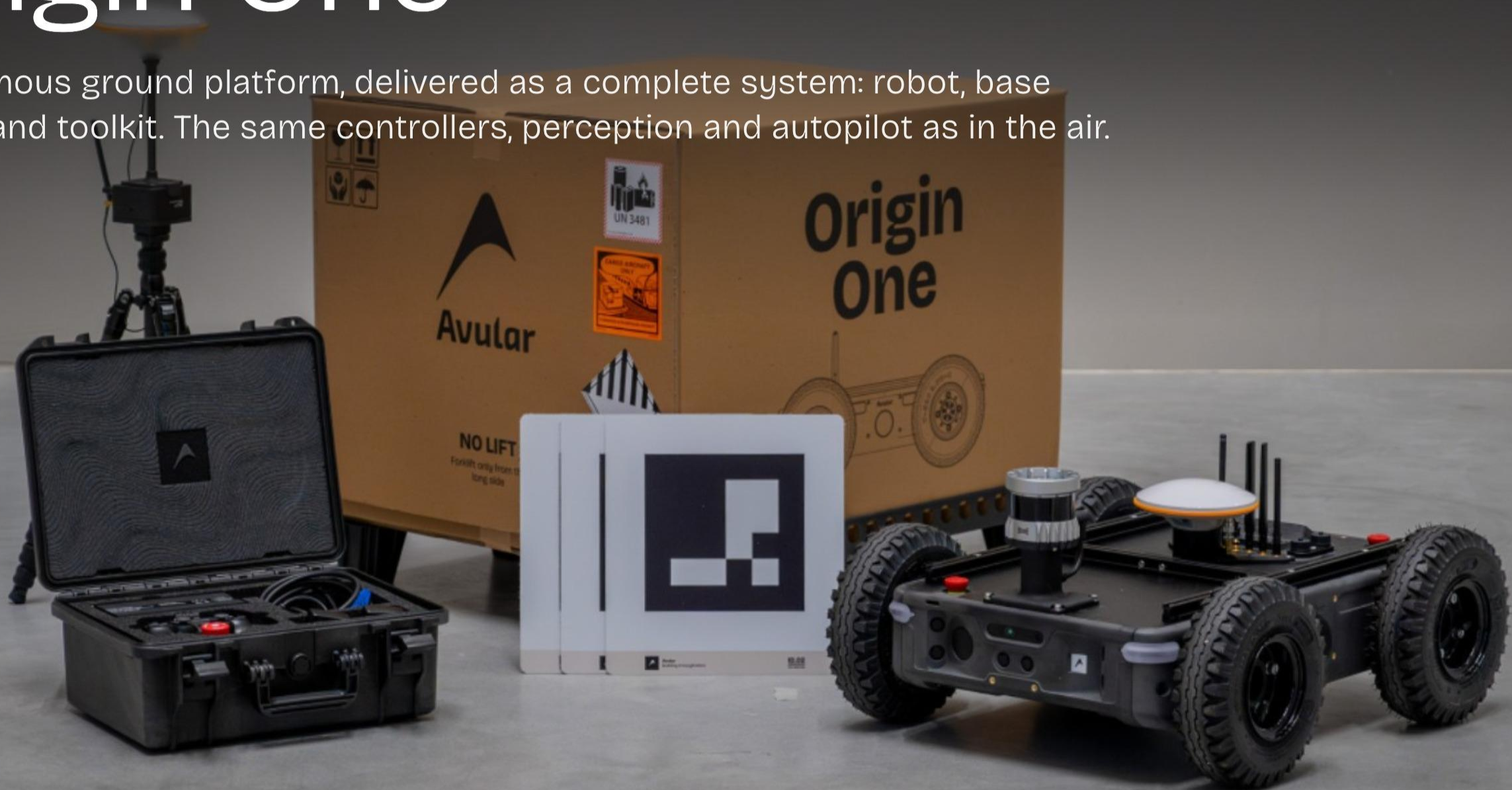
Own product

BUSINESS UNIT 01 • OWN PRODUCT

Own product

Origin One

Autonomous ground platform, delivered as a complete system: robot, base station and toolkit. The same controllers, perception and autopilot as in the air.



BUSINESS UNIT 02 · APPLIED AUTONOMY

Co-creation: autonomous robots for SGL on the green

SGL brings the market and the domain knowledge, Avular the autonomy, navigation and robotic building blocks. Together from concept to series.

Co-creation

BUSINESS UNIT 02 - APPLIED AUTONOMY

Co-creation: autonomous asphalt rolling with Heijmans

Heijmans brings the road, the crews and the safety regime of a live site, Avular the autonomy inside the roller. Fewer people on hot asphalt, the same recipe as on the green.

Co-creation



01

The breakthrough nobody planned

How a research detour became the most valuable technology on earth.

In three years, a text engine became the top of the world economy. Nobody predicted it.

€4.4_{tr}

Nvidia's market value — the most valuable company that has ever existed.

5_{of 5}

Of the five largest companies on earth, all five are priced on AI. Nvidia sells the chips, three sell the cloud, Apple sells the device it runs on.

0

People who predicted it. A 2017 translation paper, a detour into learning without labels, and the most valuable asset of the decade fell out the other end.

No industry has ever been repriced this fast, nobody aimed at it, and all of it happened in the world of letters and numbers. So **the next one will not arrive where the roadmap says** either.

Sources: companiesmarketcap.com, 13 September 2026 (Nvidia \$5.1tr) · converted at €1 = \$1.17

Extraordinarily powerful. But there are also limitations.

THE CAR WASH

Ask the smartest model on earth how to get to the car wash 100 metres away.

It tells you to walk.

It has read everything ever written about cars. It has never washed one.

WHAT INFERENCE ACTUALLY DOES

“What sounds correct?”
Not “what is correct?”

It exploits the statistical structure of human knowledge. It optimises for plausibility, not for truth.

THREE THINGS YOU CANNOT DO WITH IT

- 01** Embed a hard rule it may never break.
- 02** Ask it why it decided what it decided.
- 03** Certify it, to anyone, for anything.

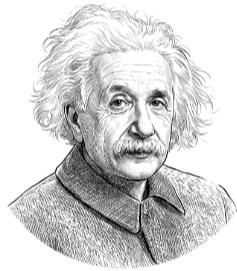
Not a bug to be patched. It is what the method is.

In a chat window a hallucination costs you a paragraph. In a 30 kg machine it costs you a wall, a wrist, or worse.



Same question. Two very different minds.

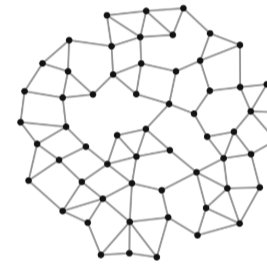
THE QUESTION "Why does a moving clock run slow?"



EINSTEIN, 1905

Nothing to look up.

He had to invent a new picture of space and time first, then find the mathematics that fitted it.



A MODEL, 2026

A flawless derivation.

In seconds, in any language, with the algebra correct — because relativity is already in the training set.

Interpolation is spectacular. Inventing the concept in the first place **is still ours.**





02

Why the real world is the hard part

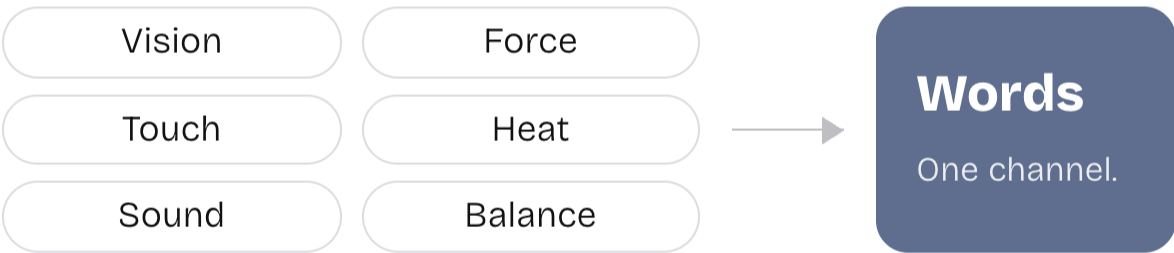
Language, scale, and the things a sentence cannot carry.

Language is a compression of the world. A robot works upstream of it.

THE COMPRESSION FUNNEL

We invented words to abstract the world.

Text models got good fast because we had already done the hardest compression for them.



An LLM has only ever seen the right-hand box. A robot lives in the left one.

TWO DOMAINS

Two completely different problems.

Read across the rows, not down the columns.

	Cyber domain	Physical domain
Input	Letters and numbers	Photons, forces, heat, contact
Ground truth	A human's opinion	Physics, which does not negotiate
Training data	The entire internet	Almost none
Cost of an error	A wrong sentence	A machine, or a person
Undo	Ctrl-Z	None

In the cyber domain you can press undo. In the physical one you cannot.



“A four-year-old has taken in more raw data through their eyes than the largest language model has read in all the text on the internet.”

Yann LeCun · Turing Award laureate

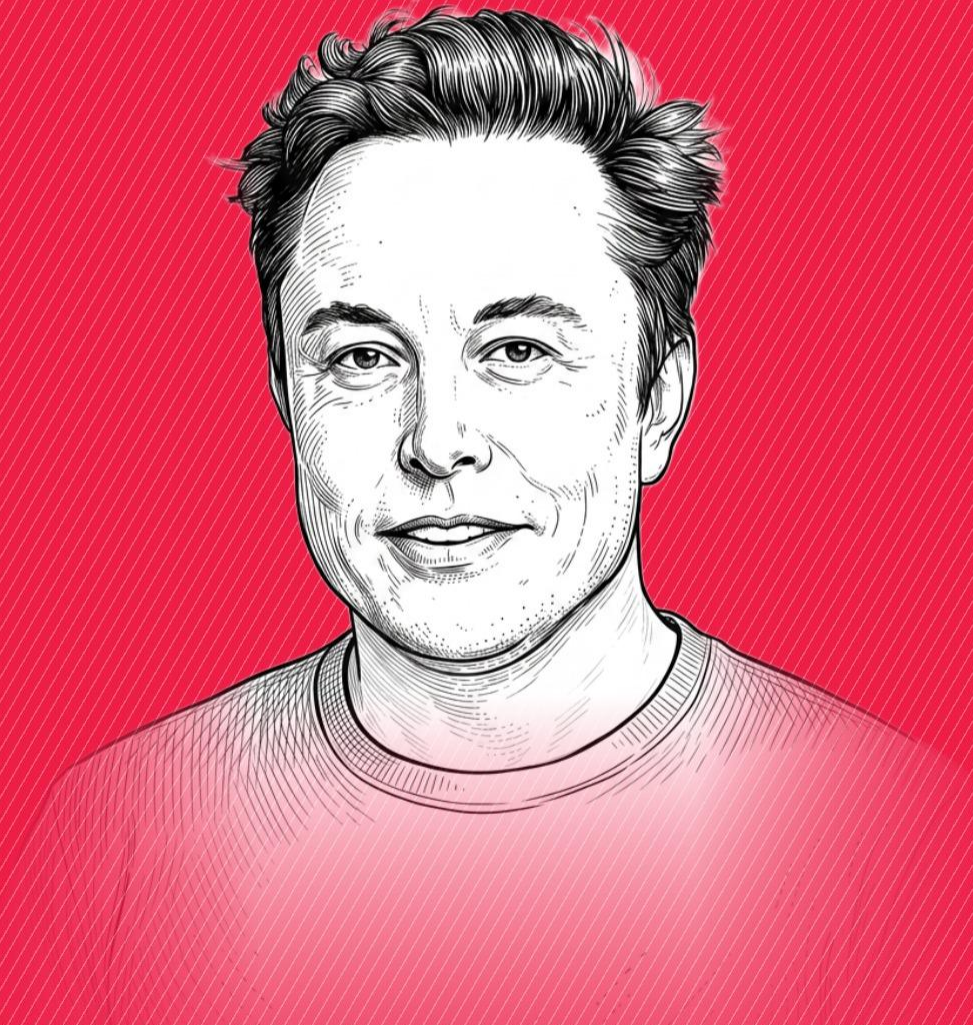
PARAPHRASED FROM HIS TALKS ON DATA, VISION AND WORLD MODELS



“Those who have lived in software land don't realize they're about to have a hard lesson in hardware.”

Elon Musk

DWARKESH PODCAST · FEBRUARY 2026



Hardware needs the right software: the Avular Autonomy Stack, not a bigger black box

One shared stack across air and ground, built for the hardware it runs on

- L4 One stack, every platform, own products and partner robots.
- L3 Hypergraph knowledge base, wall, chair, door and their relations.
- L2 Fit-for-purpose neural nets, small models on the robot's own compute.
- L1 Classical safety layer, deterministic, certifiable, never overridden.

WHAT THE HARNESS BUYS YOU

- ✓ Reasoning you can inspect, and a safety layer it cannot override
Instead of unpredictable behaviour nobody can certify.
- ✓ Rules and domain knowledge written straight into the knowledge base
Instead of hoping the model picked them up in training.
- ✓ Small models that run on the robot itself
Instead of a compute bill that grows with every retrain.

Three patents filed, approval expected by 2027.

The model is the engine. The harness around it, tools, memory, guardrails, planning loop, evaluation, is what creates real-world value. Avular builds the hardware and that harness, **for physical AI in real-world robotics.**



03

Bottlenecks, not risks

Who is actually moving, and how fast.

The largest market there has ever been, and fewer people to serve it

PAID FOR PHYSICAL LABOUR, EVERY YEAR

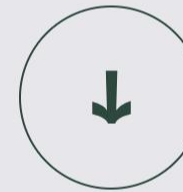
€15–23
trillion

Larger than energy and automotive together, and nobody has ever been able to sell into it. Autonomy turns that labour cost into capital expenditure; five percent of it is a trillion.

AND THE PEOPLE TO DO IT ARE RUNNING OUT

80%

of EU employers already cannot find the people they need



A workforce retiring faster than it is being replaced



Rising demand in care, construction and logistics

Robots are not a threat to labour, they are how we keep the society we have.

China saw this coming years before the rest of us

54%

of all industrial robots
installed on earth, in one
country

295k

units installed in a single year
— an all-time record

2.0m

robots already at work in
Chinese factories

€118_{bn}

state guidance fund
committed to AI and robotics

FIRST TEN WEEKS OF 2026

**€16 bn into humanoids and their
components. Eighteen rounds.**

EUROPE, MEANWHILE

**For every robot we install, China installs
three and a half.**

Two people on this planet think in bottlenecks. Everyone else thinks in risks.



Elon Musk

"I just repeatedly tackle the limiting factor. Whatever the limiting factor is on speed, I'm going to tackle that."

DWARKESH PODCAST • FEBRUARY 2026

Turbine blades. Actuators. Hands. Ore refining. Each one named, then attacked.



Xi Jinping

Robotics and embodied AI named a strategic industry in the 15th Five-Year Plan — with the state's standards, capital and procurement behind it.

MIIT NATIONAL HUMANOID STANDARD SYSTEM • MARCH 2026

Components. Standards. Deployment targets. Same method.

A risk register tells you what not to do. A bottleneck list tells you **what to do next**.

The opportunities are abundant, and it will not be one robot

A car is a robot. A crane is a robot. A drone is a robot. A humanoid doing the laundry is a robot.

Different tasks select different bodies, a Darwinian diversity of machines, not one winning shape.

The opportunities are abundant, and as a society we will need every one of them.

FAMILY OF SYSTEMS



You have the domain knowledge. We have the robotics.

Let's build them here, and give European talent the podium it deserves.



05

Five statements

Twenty minutes. You hold up a card, we find out where the room actually stands.

GREEN CARD • I AGREE

RED CARD • I DISAGREE

Before we argue – a sense of scale



An eight-percent day at Nvidia is worth more than the whole of ASML.

No European robotics company would make a visible bar on this chart.

Approximate market values, August 2026 · companiesmarketcap.com · converted at €1 = \$1.17

STATEMENT 01 • CAPITAL

Europe does not have a technology problem. It has a capital problem.

GREEN • AGREE

The knowledge is already here. The cheques are not.

RED • DISAGREE

More money into the same structures changes nothing.

STATEMENT 02 • VALUE CHAIN

Europe needs to own the value chain again.

GREEN • AGREE

Whoever owns the chain sets the terms: on price, on updates, on uptime.

RED • DISAGREE

Nobody owns a whole chain anymore. Specialise where we are strong and buy the rest.

STATEMENT 03 • AMBITION

We need to dare to dream again, and help each other build the superpowers Europe needs.

GREEN • AGREE

Every European champion started as a plan that looked too big.

RED • DISAGREE

Dreams do not ship. Europe has a delivery problem, not an ambition problem.

STATEMENT 04 • ITERATION



Ramp up the design cycle: iterate more, fail faster, and learn to cherish the failure again.

GREEN • AGREE

The team that iterates ten times learns ten times as much on the same technology.

RED • DISAGREE

Failing fast is a software luxury. A half-tonne machine gets one chance.