



E-BOOK

What emerging technologies are up next?



A note about this e-book



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This e-book is an abridged version of our popular webinar “What Emerging Technologies Are Up Next? From Early Signals to Commercial Reality.”

For the full webinar, which provides more research and context, please visit our website [here](#).

EXECUTIVE SNAPSHOT

What Emerging Technologies Are Up Next?

What You Need to Know

AI is pulling a new wave of technologies out of the lab. Companies that test business fit now will be ready to scale before markets react.



PRODUCT DESIGN & INNOVATION

Use AI-enabled discovery to speed development but validate digital results with physical or clinical testing.



BRAND

Lead with proven capabilities, not demonstrations. Humanoids will attract hype long before they deliver commercial value.



SUPPLY CHAIN & OPERATIONS

Plan for manufacturing and integration early. Optical hardware and novel materials need infrastructure to scale.



GROWTH POTENTIAL

Dabble while entry costs are low and increase investment as evidence of business fit grows.

Key takeaways

01

The AI boom is driving early stage innovation across all industries.

The advent of AI is creating demand for new technologies and enabling innovations across a wide range of sectors.

02

Early stage signals are trackable — and show now is a good time to dabble.

Now is the time to understand if these emerging technology areas are a fit for your business or something that is better left to other players.

03

A humanoid robot hype cycle may be up next.

Many of the current crop of AI companies pivoted from blockchain to AI. We may see another pivot in the future if the AI bubble bursts.

EXECUTIVE SUMMARY

The next wave is already in motion

Key takeaway: *Early momentum gives leaders a window to test business fit before broad commercial adoption.*

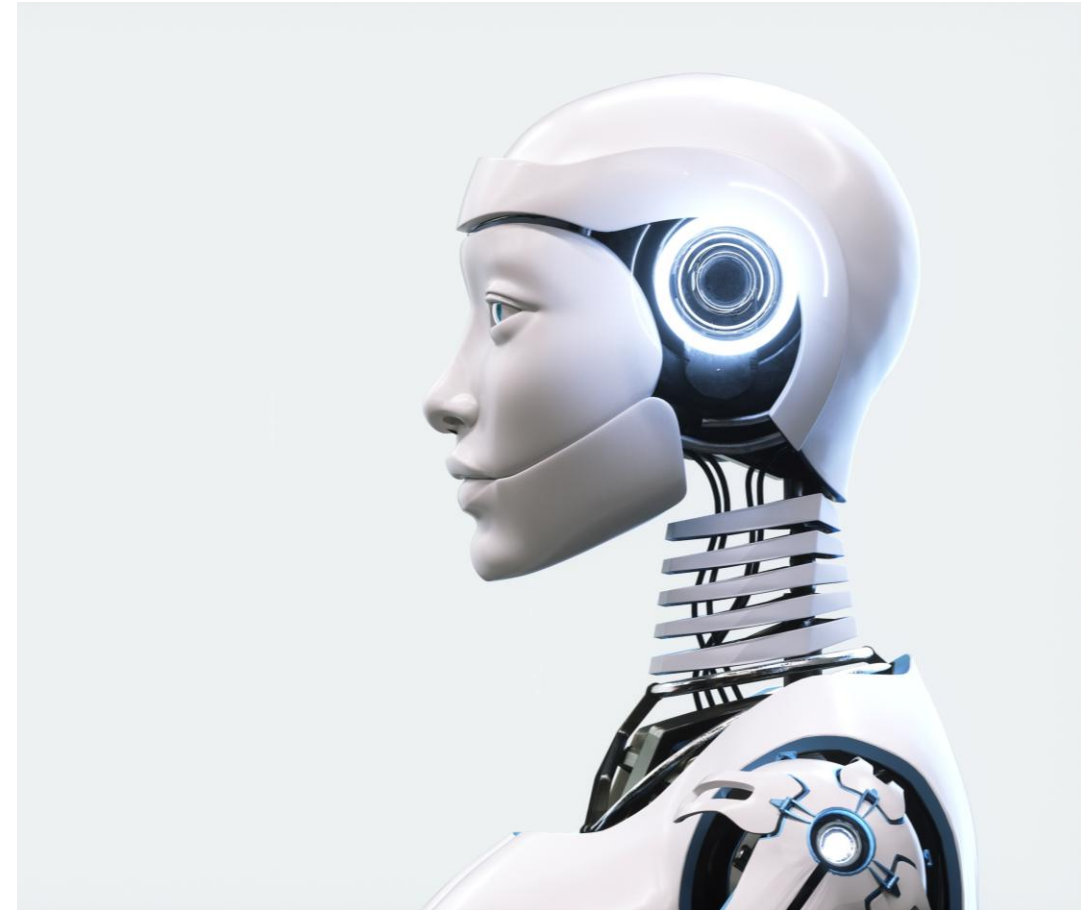
AI dominates the headlines, while geopolitical and climate volatility make long-term planning harder.

Yet today's breakthroughs started years ago. The transformer paper behind today's large language models appeared in 2017 and didn't spark a boom until 2023.

Lux scanned more than 3,000 technologies to find platforms with strong momentum and relatively low maturity. Six stand out:

- Humanoid robotics
- Optical computing
- Materials informatics (discovery)
- Crop stress management
- Distributed energy simulation
- AI-driven diagnostics

Every one either benefits from or supports the AI boom. That pattern emerged from the data, not from selection.



THE 3D METHOD

Spot technologies as they leave the lab

Lux tracks technology maturity in three stages:



DISCOVER

Generation 1

Academic research establishes mechanisms and models.



DABBLE

Generation 2

Teams test applications and push technical limits.



DEPLOY

Generation 3

Organizations scale proven applications and build production capability.

Factories are the proving ground, not the prize

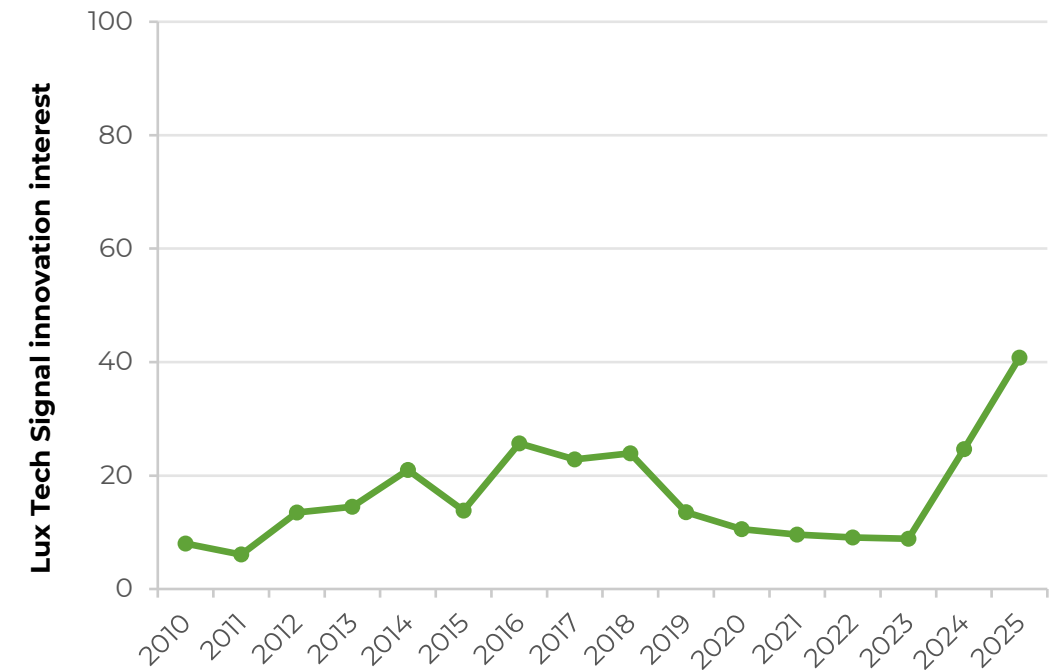
Human spaces offer the most distinctive long-term opportunity for humanoids.

Physical AI models improve perception and movement. Factory trials offer evidence of progress, while mobility in homes and hospitals remains immature.

Figure 02 loaded more than 90,000 parts over 1,250 operating hours on a BMW assembly line, contributing to 30,000 X3 vehicles.

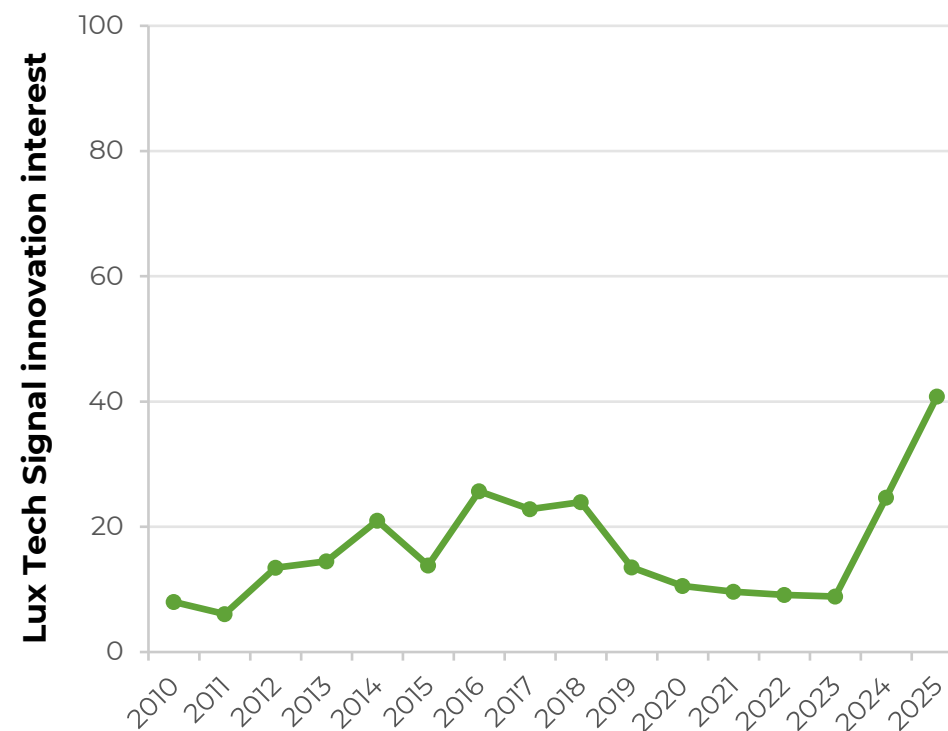
Figure 03 returned in June 2026 for more complex sequencing. Teams still need to establish reliable operation, safety and economics across less controlled settings.

Humanoid robotics



LUX TAKE

Humanoid Robotics



Photonic acceleration is entering commercial evaluation

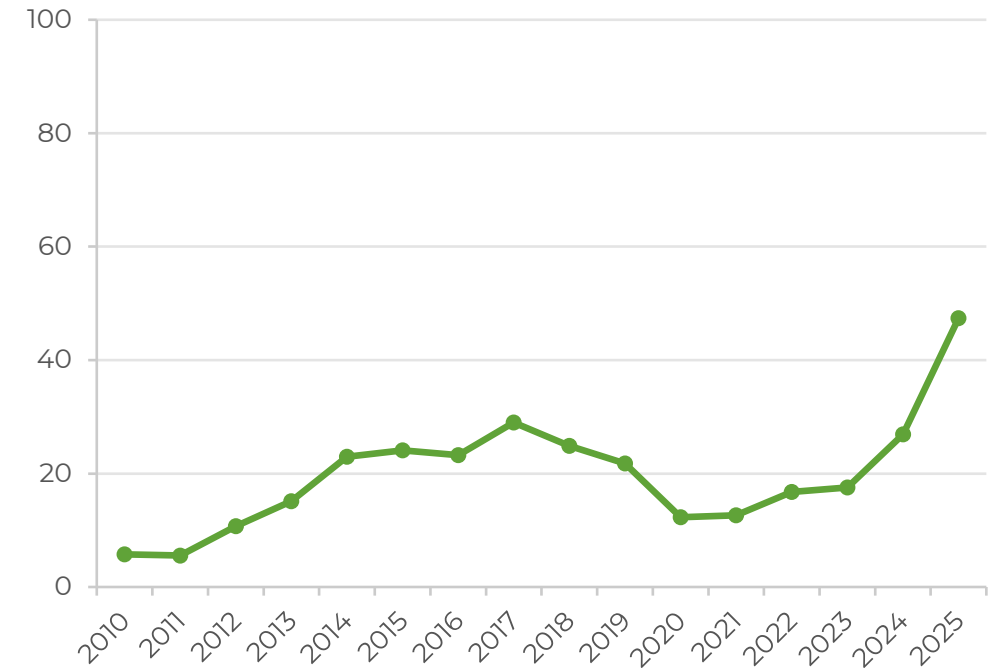
Specialized optical hardware creates an entry point into AI infrastructure.

Photonic processors use light to transmit data. Co-processors and optical interconnects can work alongside conventional CPUs and GPUs as AI demand strains power and bandwidth.

Q.ANT uses thin-film lithium niobate photonic circuits for selected AI and simulation operations. IONOS became its first commercial customer in May 2026.

Integration, programmability and scaled manufacturing remain central barriers. Current capabilities serve specialized workloads.

Optical computing



Lux Tech Signal innovation interest (unitless)
100 = highest possible score

Faster discovery still depends on physical validation

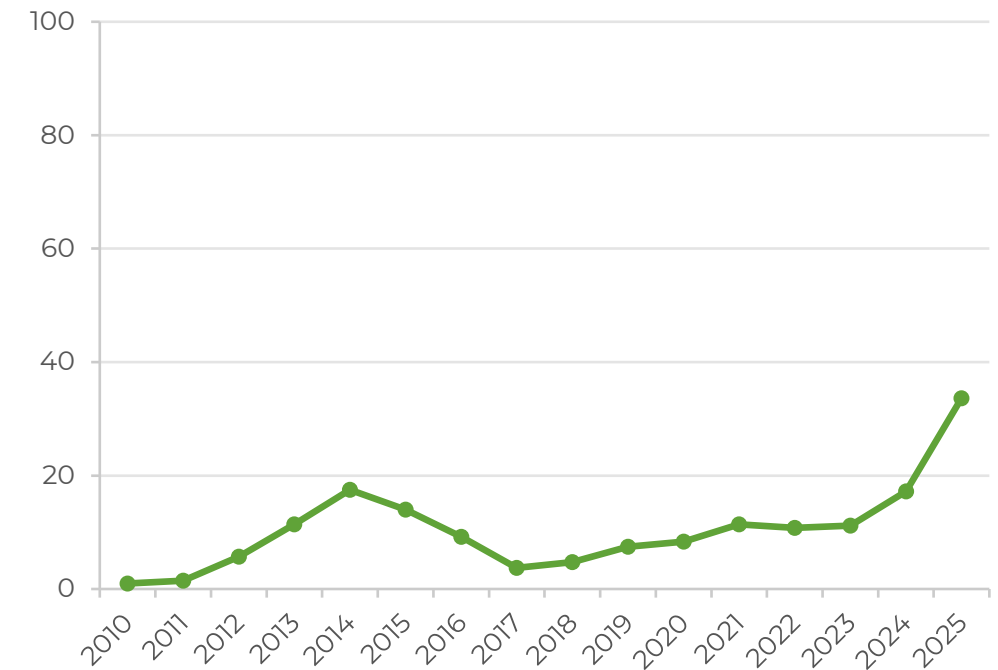
Computational screening creates value when teams can synthesize and manufacture the resulting material.

New compute capacity, synthetic data and automated experiments renew interest in materials discovery beyond formulation optimization.

MatNex screened more than 100 million candidate compositions to identify MagNex, a rare-earth-free permanent magnet. It worked with the University of Sheffield and Henry Royce Institute to synthesize and test the material.

Manufacturing infrastructure remains a constraint. Electronic compounds offer a more accessible initial target than complex alternatives such as polymers.

Materials informatics (discovery)



Lux Tech Signal innovation interest (unitless)
100 = highest possible score

Better sensing enables earlier intervention in crop stress

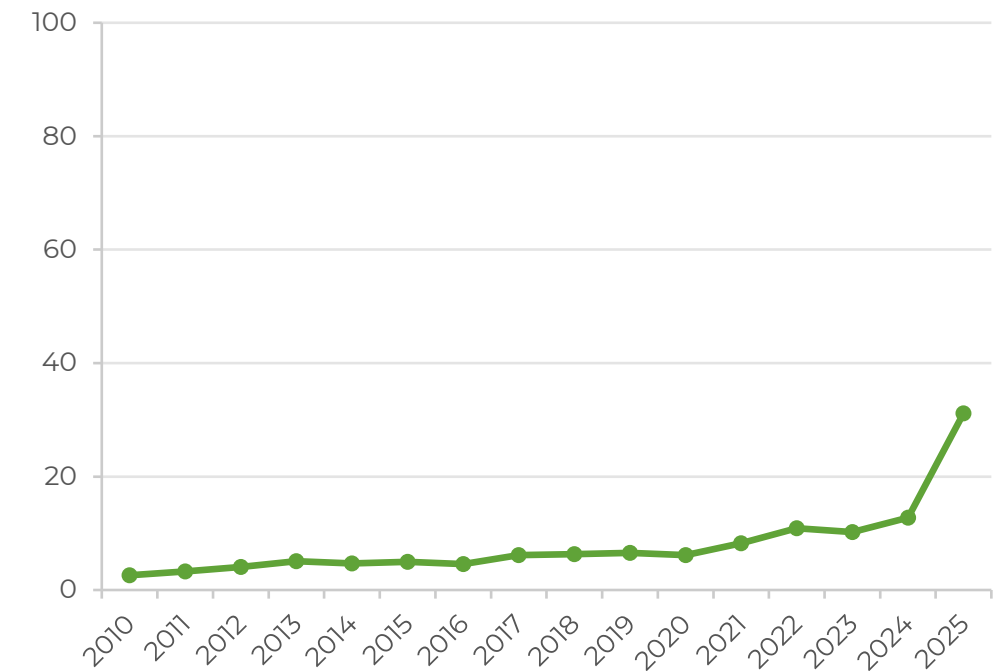
New capabilities combine with established platforms as climate stress increases.

Traits, sensors and discovery tools increasingly work together to address crop stress. AI improves the ability to interpret high-resolution imaging and detect problems early.

Sentera uses drone-based multispectral data for detection at the leaf level. Multispectral and hyperspectral imaging can support intervention against pest and disease pressures.

John Deere's acquisition of Sentera illustrates consolidation in precision agriculture, with stress management becoming a more important capability.

Crop stress management



Lux Tech Signal innovation interest (unitless)
100 = highest possible score

Faster grid simulation supports more planning scenarios

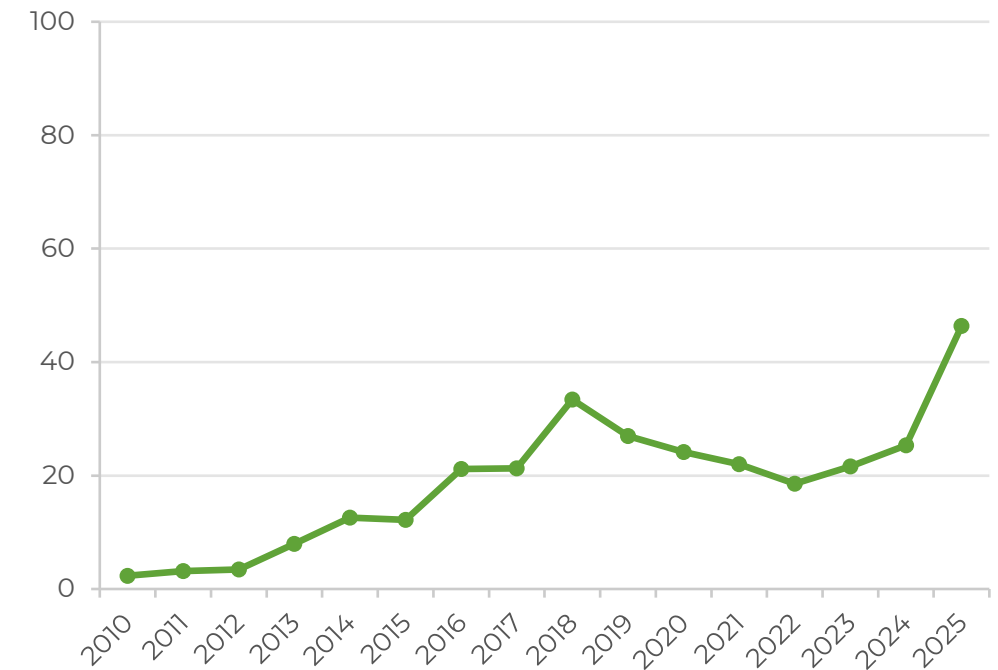
Utilities need reliable models to manage growing network complexity and interconnection demand.

Digital twins of distribution networks combine asset information with smart meter data. AI state estimation can fill blind spots and forecast congestion or connection capacity.

ThinkLabs combines machine learning with power system equations. It aims to reduce analysis times from hours or days to minutes, allowing utilities to examine more scenarios.

Operator trust remains essential. Faster analysis must also deliver the reliability required for infrastructure decisions.

Distributed energy simulation



Lux Tech Signal innovation interest (unitless)
100 = highest possible score

Software expands the value of sensors and wearables

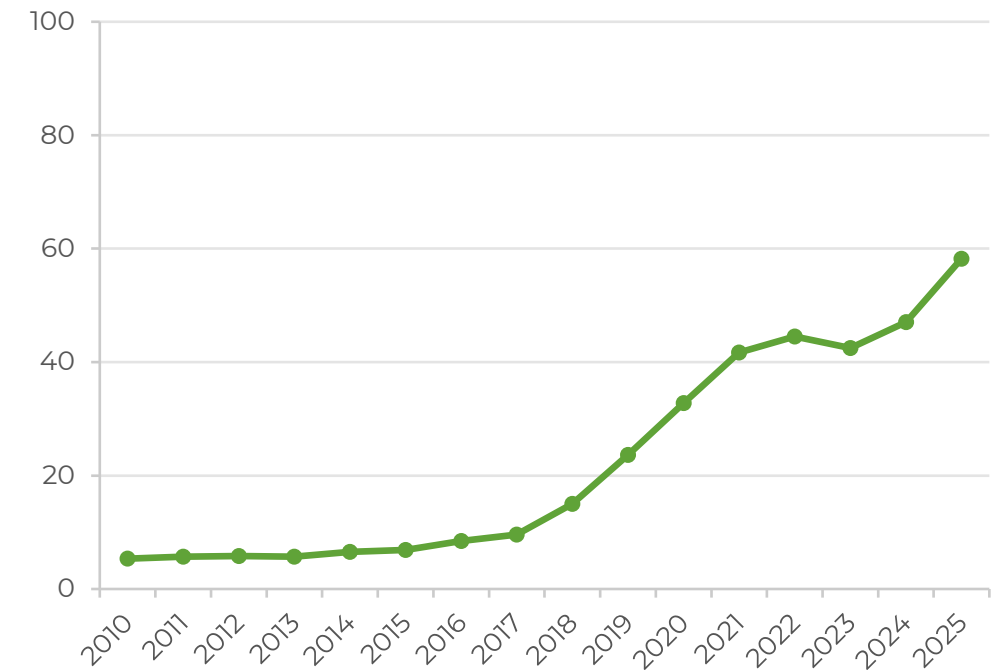
Combining sensing with AI creates new care capabilities, while clinical validation remains uneven.

AI can improve detection across imaging and biosignals. Digital biomarkers and monitoring tools create opportunities for more distributed care.

Hinge Health combines wearable motion sensors, computer vision and coaching in virtual rehabilitation for joint and muscle conditions.

The opportunity comes from capabilities working together. This analysis groups several related health signals, so its trend differs from the individual technology categories.

AI-driven diagnostics



Lux Tech Signal innovation interest (unitless)
100 = highest possible score

About Lux

Lux Research fuels innovators to not only imagine what's possible in the future but also operationalize innovation success in the near term. We deliver research and advisory services to inspire, illuminate, and ignite innovative thinking that reshapes and grows businesses. Using quality data derived from primary research, fact-based analysis, and opinions that challenge traditional thinking, our experts focus on finding truly disruptive innovations that are also realistic and make good business sense.

The “Lux Take” is trusted by innovation leaders around the world, many of whom seek our advice directly before placing a bet on a startup or partner — our clients rely on Lux insights to make decisions that generate fantastic business outcomes. We pride ourselves on taking a rigorous, scientific approach to avoid the hype and generate unique perspectives and insights that innovation leaders can't live without.



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Humanoids could drive the next innovation hype cycle

01

Compute continuity

The webinar traces a common infrastructure thread from crypto mining to AI chips, data centers and memory. Robotics can benefit from the same compute base.

02

A compelling narrative

Humanoids offer a story of widespread change and may attract market enthusiasm. Lux presents this as a forward-looking hypothesis about the 2030s.

03

Broader robotics value

Drones, underwater robots and industrial automation also offer useful capabilities. Commercial progress can occur across robotics even if hype concentrates on humanoids.

Three priorities for early technology exploration

01

Identify business fit

Select applications that address a defined need. Use early signals to decide which platforms merit investigation and which sit outside your priorities.

02

Test the critical barrier

Focus exploration on what limits the use case: integration, manufacturing, mobility, operator trust or clinical evidence. Seek proof that addresses that constraint.

03

Track readiness over time

Follow changes in innovation activity alongside application evidence. Revisit investment decisions as teams demonstrate performance and a credible path to production.