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micropsi
industries

Bridging labor gaps and boosting productivity: AI-powered vision in manufacturing

Assembly Show 2024



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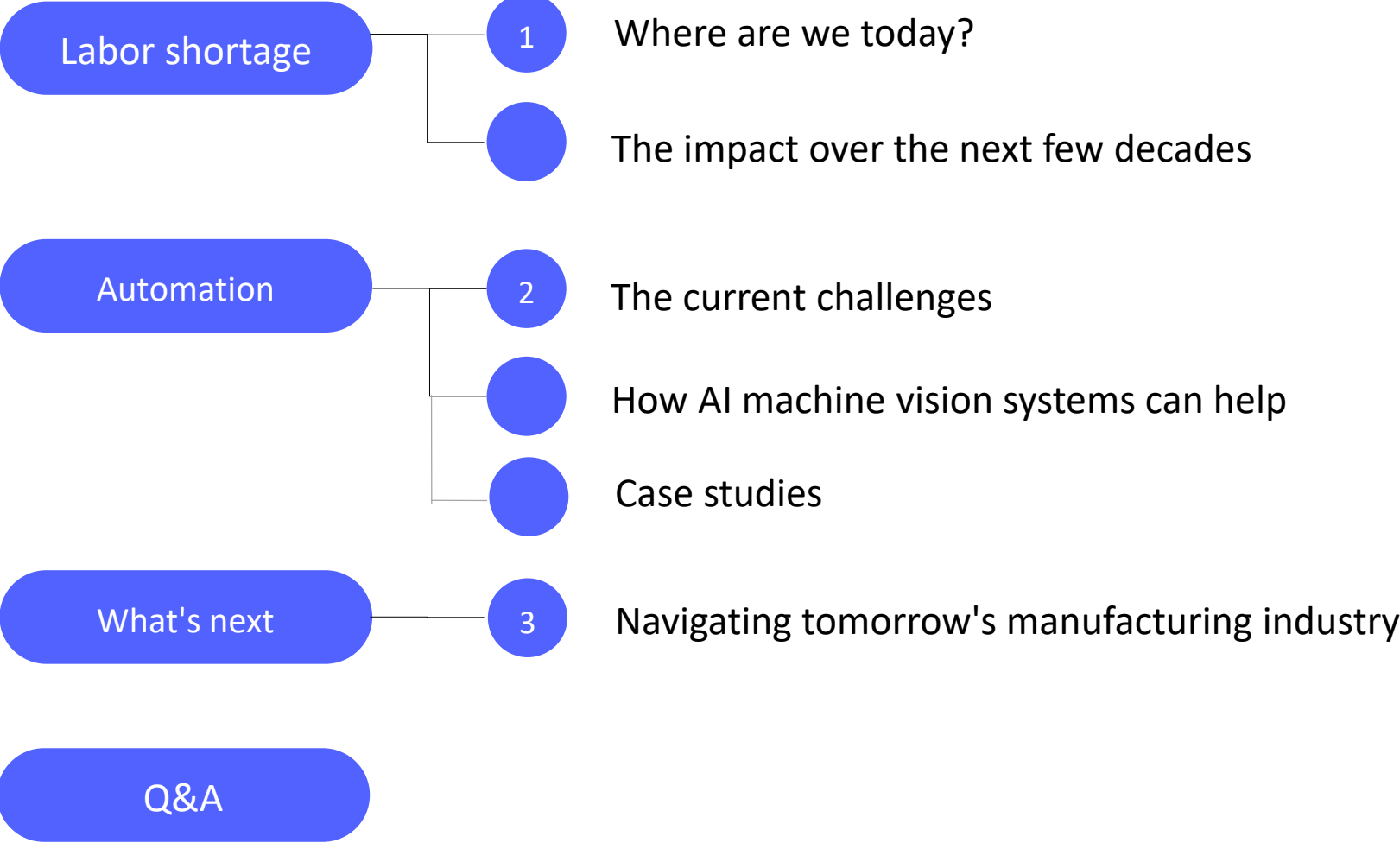
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Micropsi Industries

- A robotics software company that combines AI and industrial robotics
- Founded in the fall of 2014
- Market launch of flagship product MIRAI in 2019
- Team of 70+ experts located in Berlin, Boston, and San Francisco
- March 2024: Launch of MIRAI 2

Agenda



2.1 million openings by 2030

- 67% cited employee attraction and retention as their top challenge.
- As of January 2024, a gap persists, with 622,000 total manufacturing job openings yet to be filled.



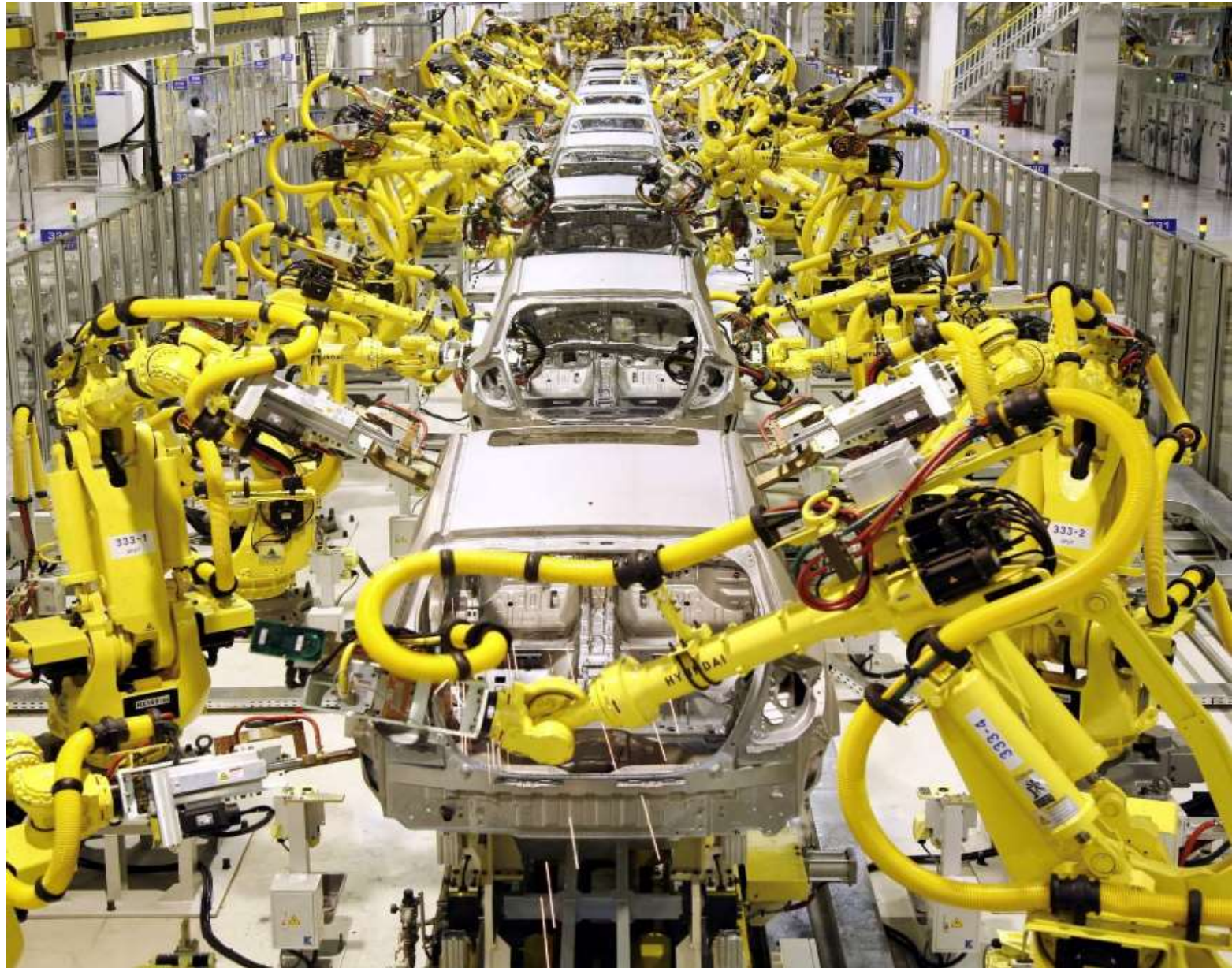
Globally, things don't look better

- Job vacancies per unemployed person increased by more than four times on average between 2010 and 2023.
- Even though the global labor shortage has eased since COVID-19, the gap in skilled labor is growing.
- 75% of European employers could not find workers equipped with the right skills in 2023.



What comes next?

While "lights-out" factories may still be unrealistic (for now), many global trends will force more and more manufacturers to automate in order to meet growing demand.





Traditionally, productivity boosts came from hiring, rather than tackling complex challenges like automation.

The challenges

Many production tasks, especially in assembly and testing, require more flexibility and must therefore be performed by humans.

- Tasks must be understood geometrically
- Robots' movements must be identical for each execution
- Movements are not sensor-based



Forget traditional vision systems

Standard vision systems struggle with variance and changing conditions.

Their sensitivity to certain environmental changes often leads to inefficiency and increased costs.

	Classic 2D/3D vision	MIRAI
Measurement (Calibration)	Required/must be precise	Not required
Path planning	Before the execution	During the execution
CAD needed	Typically, yes	No
Control during joining/positioning	No	Yes
Reflection/Transparency	Needs to be eliminated	Trained to ignore

What makes MIRAI different

MIRAI excels in changing factory conditions. It's more robust, flexible, and precise than traditional vision systems.

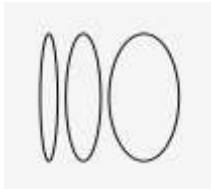
- Handles shiny and reflective objects
- Easily adapts to process changes
- Deals with dust, dirt, and grime
- Tracks moving objects in real time
- Does not require calibration or CAD data



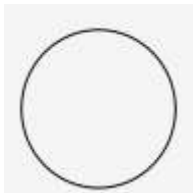
AI vision enables robots to handle variance



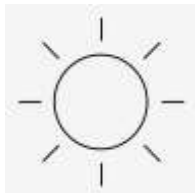
Position



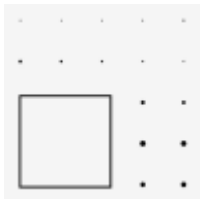
Shape



Color



Light



Background



Position, lighting, background



Position



Position, lighting, background



Position, form, lighting, color, background

USE CASES

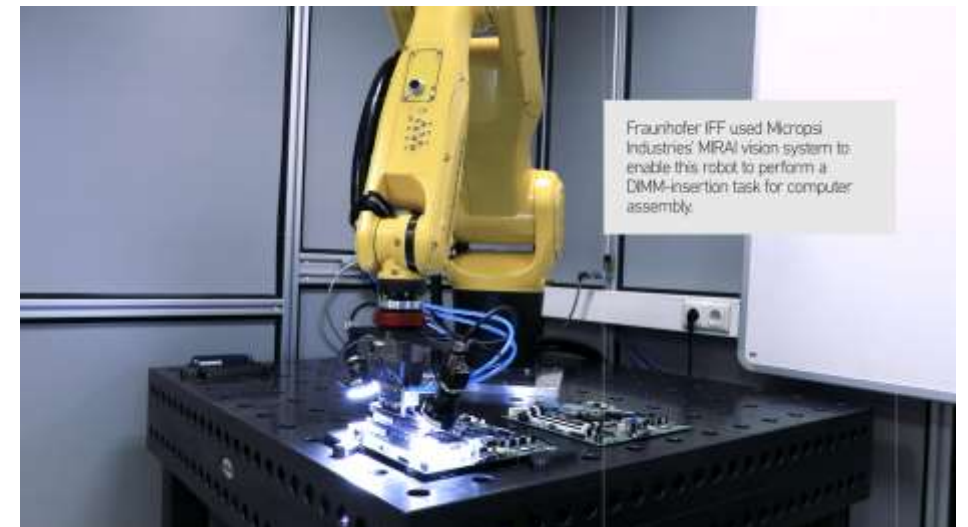
BSH, leak testing

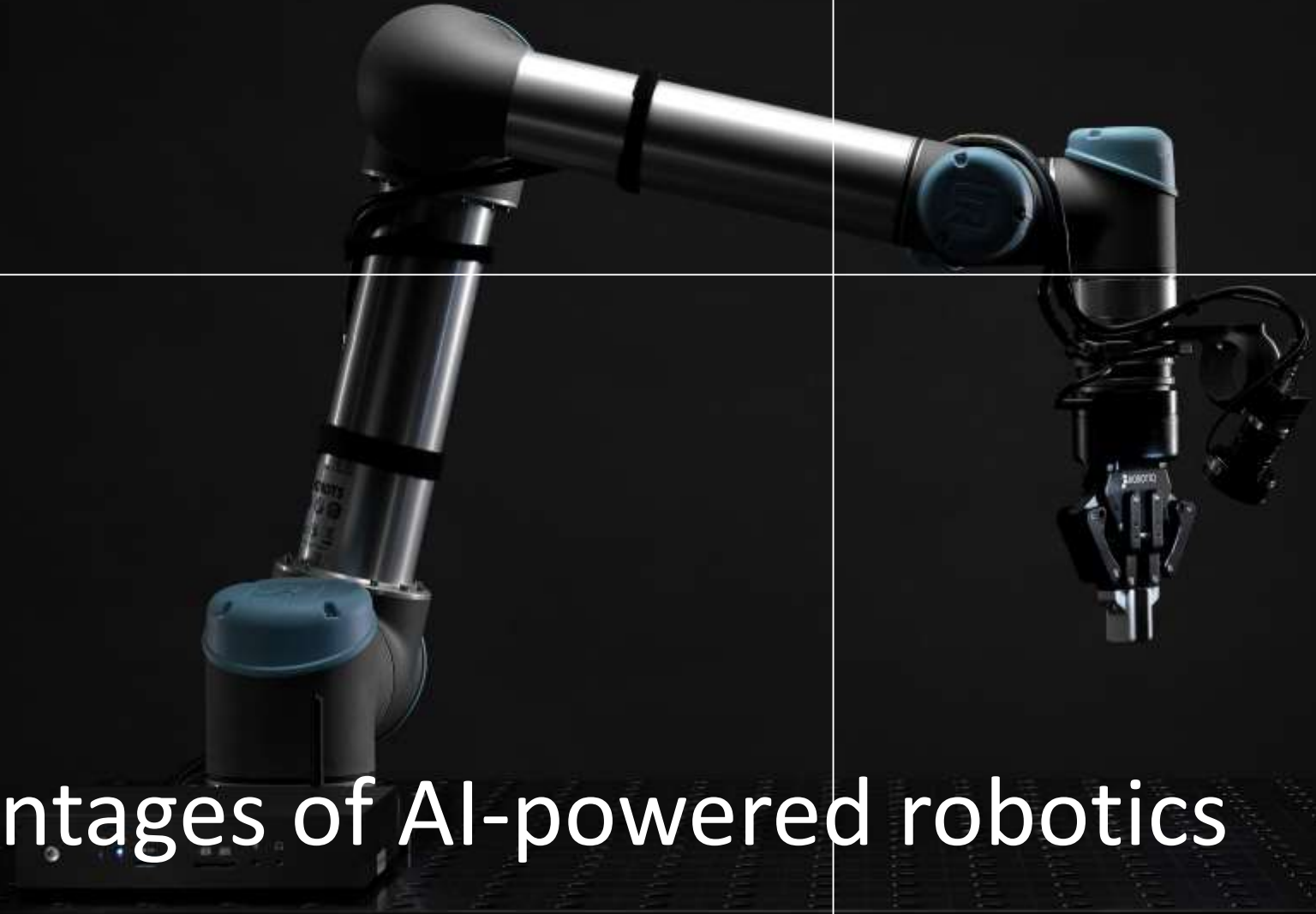


Clickbond, assembly



Electronic assembly

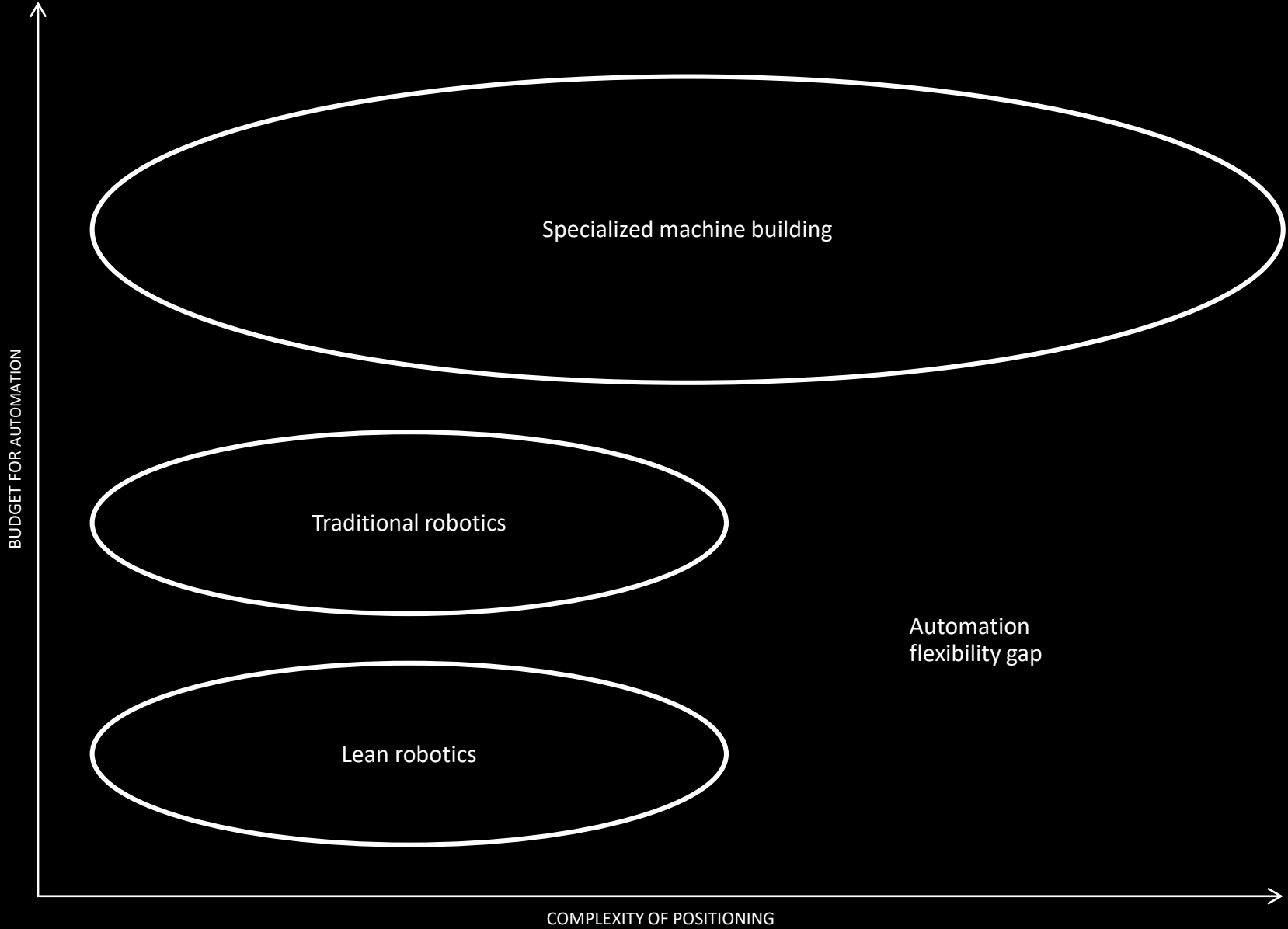




Advantages of AI-powered robotics

Automation flexibility gap

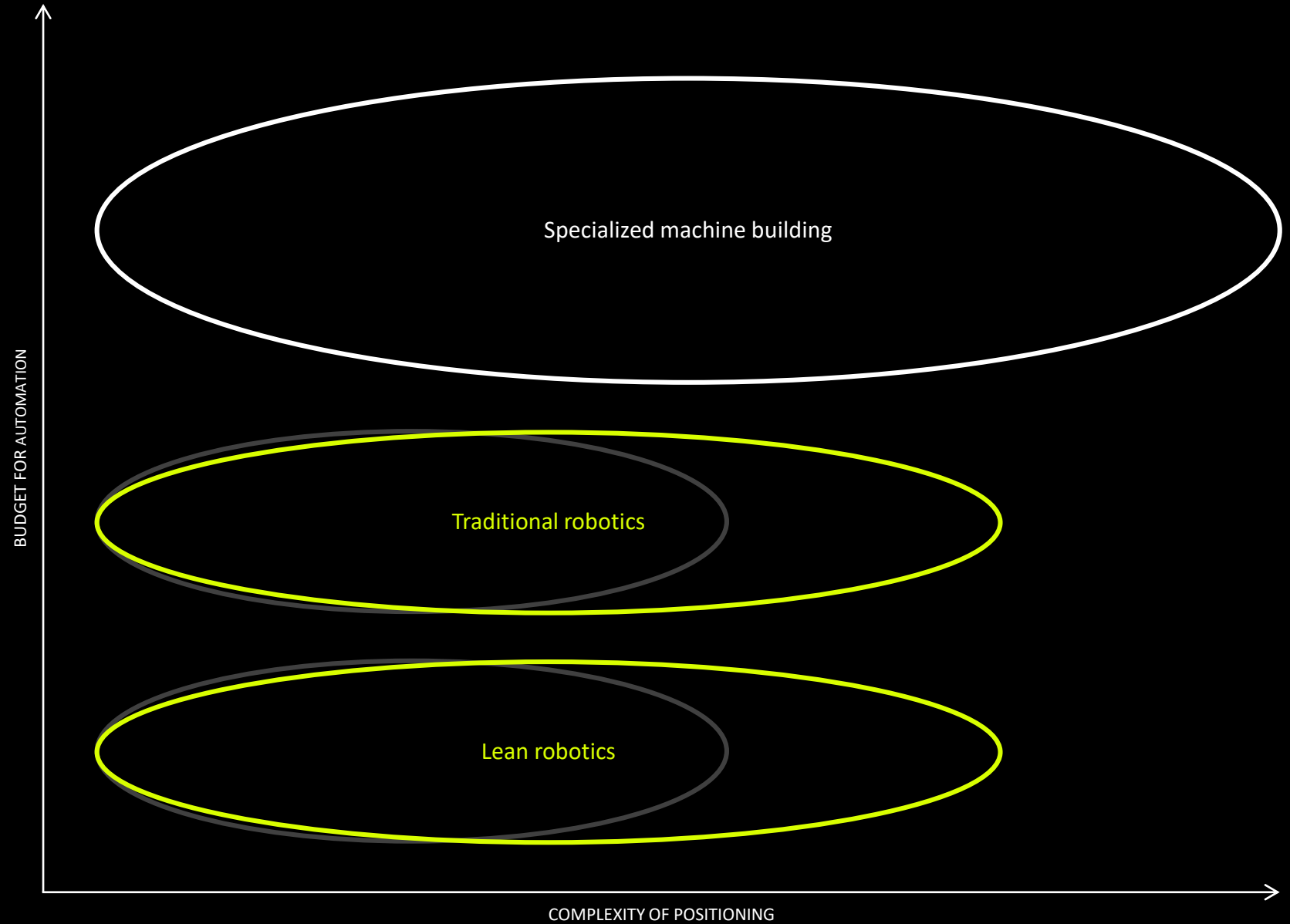
Complex positioning tasks today must reach a certain predictable high volume in order to make automation economically viable. People fill the flexibility gap today. They adapt quickly to new tasks and to variations of the current task.



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AI-guided robotics



Benefits of AI vision software

- Adapts to dynamic factory conditions
- Takes over manual tasks
- Is reliable and scalable
- Adapts to changing automation needs
- Does not require extensive in-house expertise
- Ensures consistent production quality



What makes MIRAI unique



No programming needed

Our team will help install MIRAI the skills your production team needs. We'll also show you how to train new MIRAI skills on your own.



High level of real-time precision

Adjustments of less than 1 mm can be made in real time for any object



Flexible, versatile and ready for expansion

Train on a wide range of tasks and iterate for further processes or steps



Attract new talent

Robots perform monotonous tasks

Companies can offer new recruits interesting, dynamic jobs instead of repetitive tasks, increasing retention rates.


Automate unergonomic tasks

Protect your team's health by automating unergonomic processes.

AI-powered robotics can improve the reputation of manufacturing

Working alongside cobots or learning how to train industrial robots? Our experience shows that these initiatives attract new talent.



A robotic arm, likely a KUKA model, is shown in a dark, industrial setting. The arm is positioned horizontally, extending from the left side of the frame towards the right. It has a blue base and joints, and a black end effector. The background is dark with some faint grid lines.

Navigating tomorrow's manufacturing industry



What's next for manufacturing technology

- (Even) Faster real-time response with edge computing
- Expanded use of generated camera data, e.g. for predictive maintenance or quality assurance
- Easier deployment and training
- Increased number of capabilities, allowing manufacturers to automate a wider range of tasks
- Reduce physical strain in production tasks through collaboration between robots and human workers.

Getting started with automation

Start small! Don't pick the most difficult application in the plant.

- ✓ Allows you to get comfortable with the tech
- ✓ Find a promising ROI case, for more buy-in from all stakeholders
- ✓ Avoid frustrations



Getting started with automation

- Have a backup plan!
- Take advantage of collaborative robots being safe and easy to move
- Test your skills before implementing in production to eliminate unnecessary downtime



Q & A



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Thank you!

Questions or inquiries?

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