

# Machine Vision — Market Status and Strategic Trends

Dr Chris Yates — Partner, Vision Ventures





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**VISION  
VENTURES**





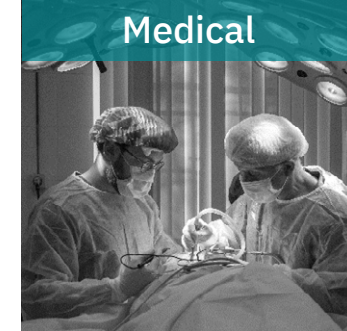
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Food



Transport



Medical



Logistics



Robotics



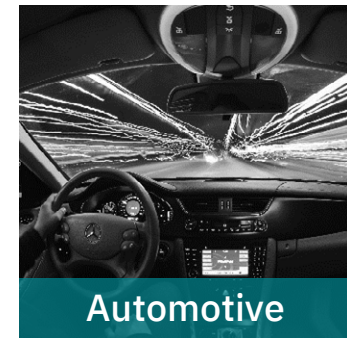
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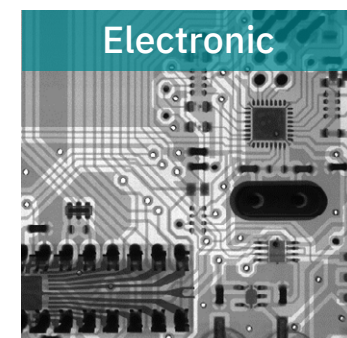
Buildings



Manufacturing



Automotive



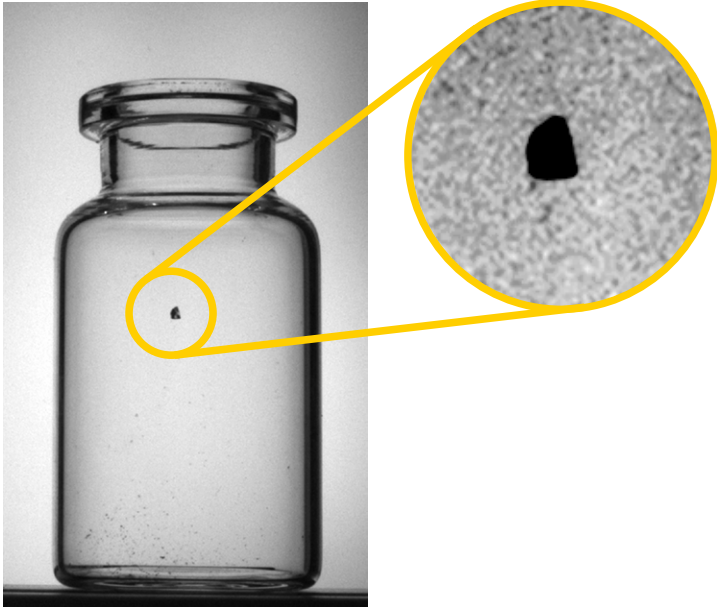
Electronic



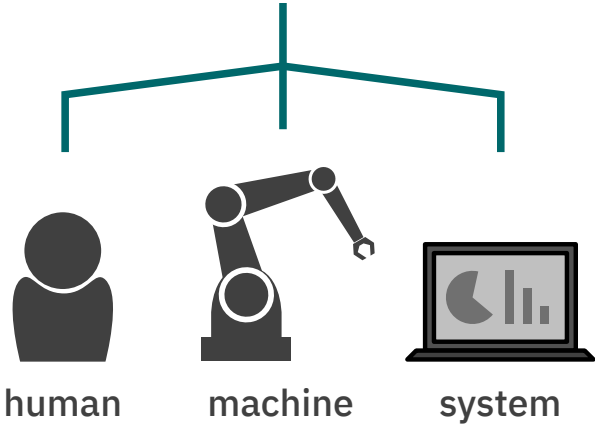
Aerospace

The vision sector is a high-growth, high-tech, and innovative marketplace covering many industry verticals

# Machine vision automates the delivery of critical information



**VIAL: Not OK**



# Machine Vision — a strategic growth market

## System-Solutions



## Products



## Components



# Machine Vision — a strategic growth market

## System-Solutions



## Products

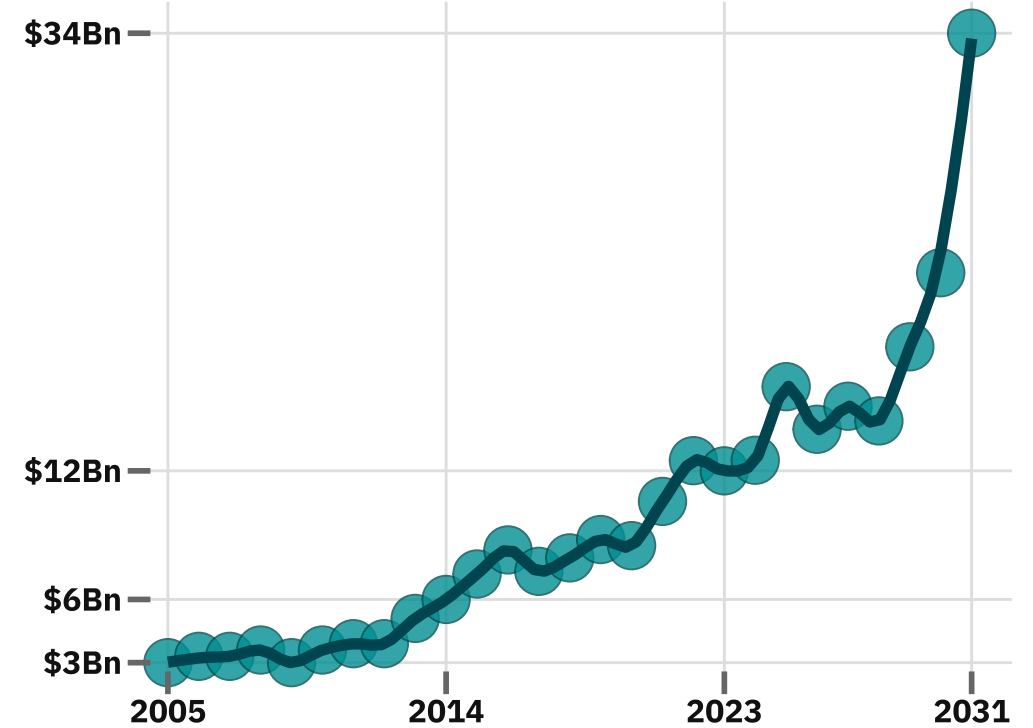


## Components



## Est. Global Machine Vision Market Size

CAGR 2005-2031: 10.1%



6.6%  
2005–2013

8.9%  
2014–2022

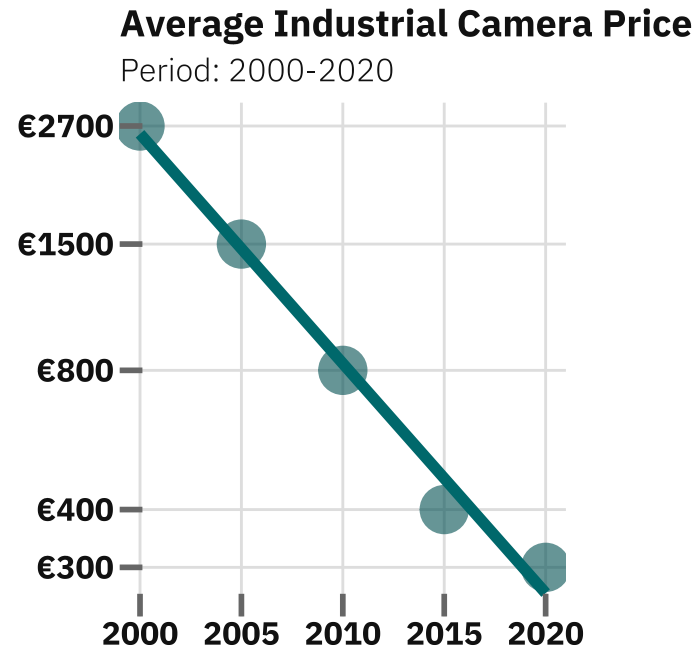
11.9%  
2024–2031

machine  
vision  
market

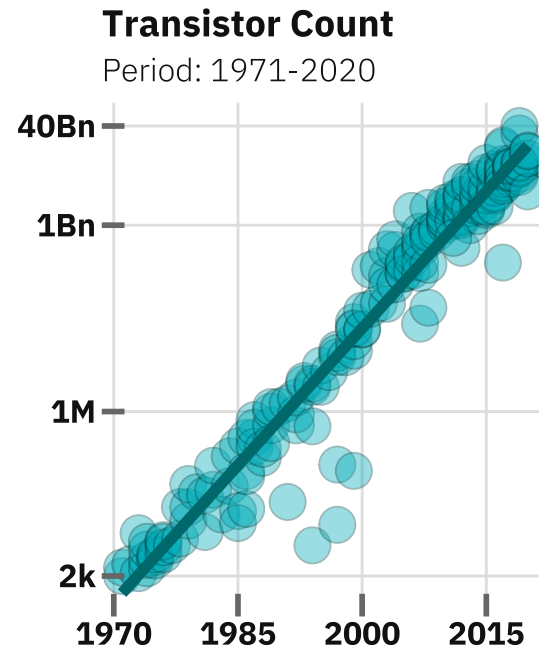
**13–14 \$Bn**

**~8% CAGR**

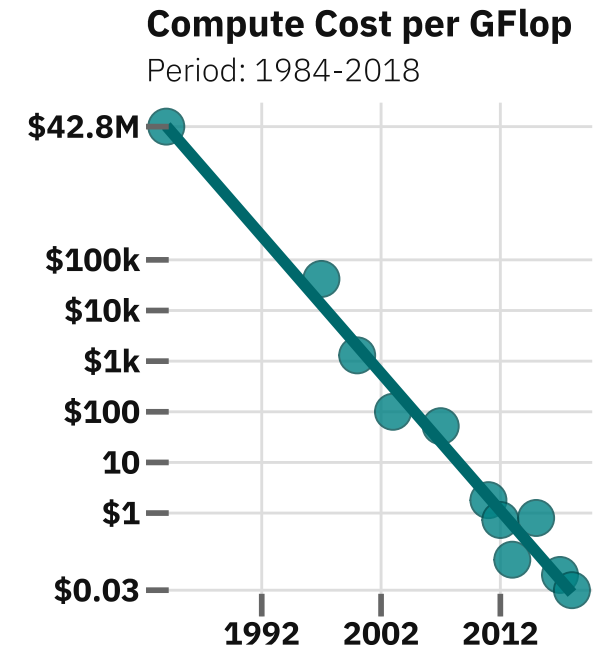
# Dramatically higher performance at lower cost has enabled vision market growth



**10x** fall in industrial camera price over 20 years



**10Mx** increase in transistor count per processor



**1.5Bnx** reduction in compute cost

# 2023–2024 outlook weakening – partially sector dependent

**Covid-19 produced strong increase in revenue** – orders increased, accelerated investment in e-commerce and pharma

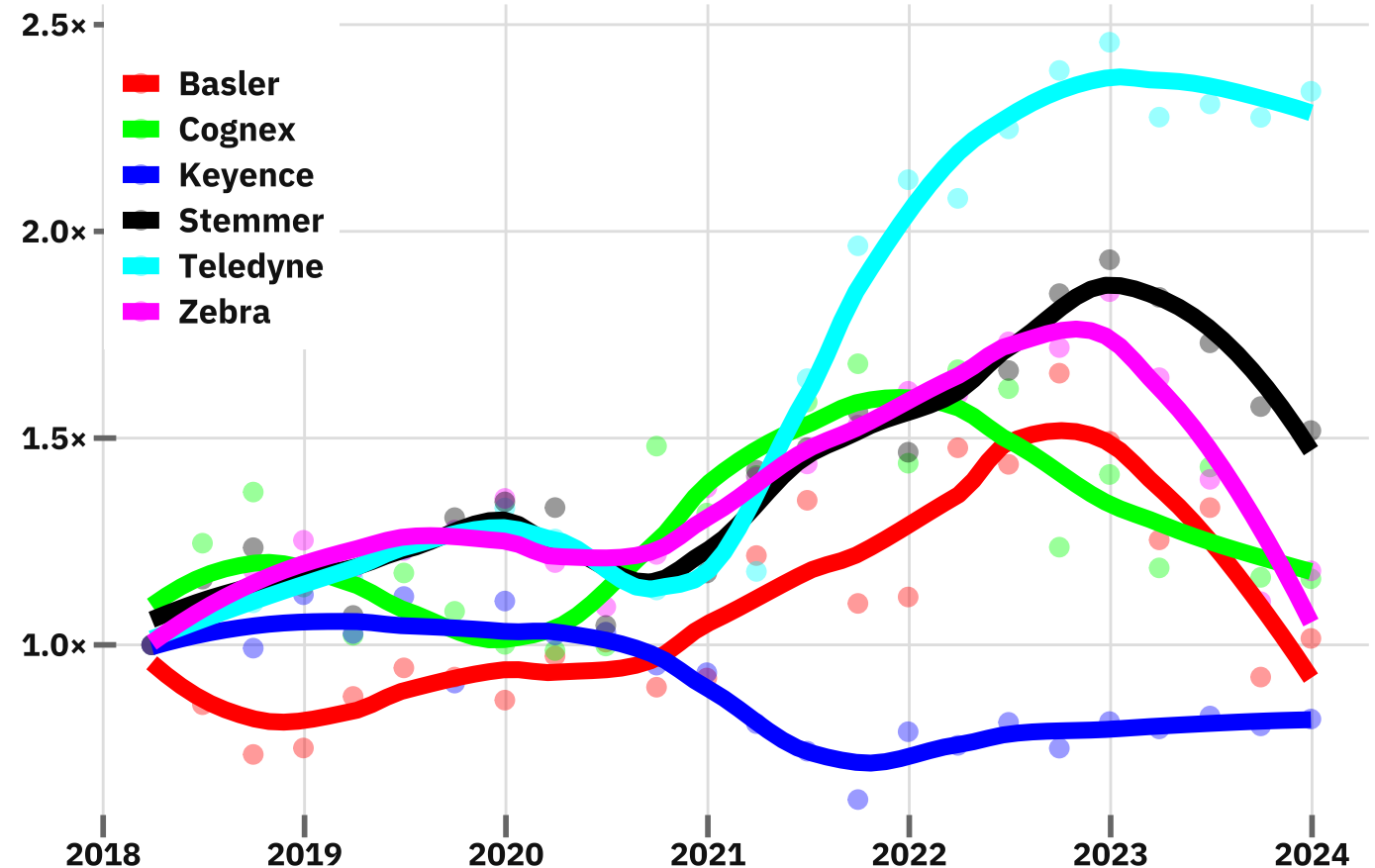
**Supply chain constraints** – shortage of components and overstocking across the value chain

**Inflationary cost pressures and China zero-Covid policies** – reduced demand and capacity for consumer electronics

**Current outlook remains weak with pick-up expected in early 2025**

**Quarterly Revenue: Public Vision Companies**

Rebased Q1 2018





# M&A activity has grown over the past two decades – more financial investors now participating

**€4.9Bn**

Cumulative company revenue

**€12.9Bn**

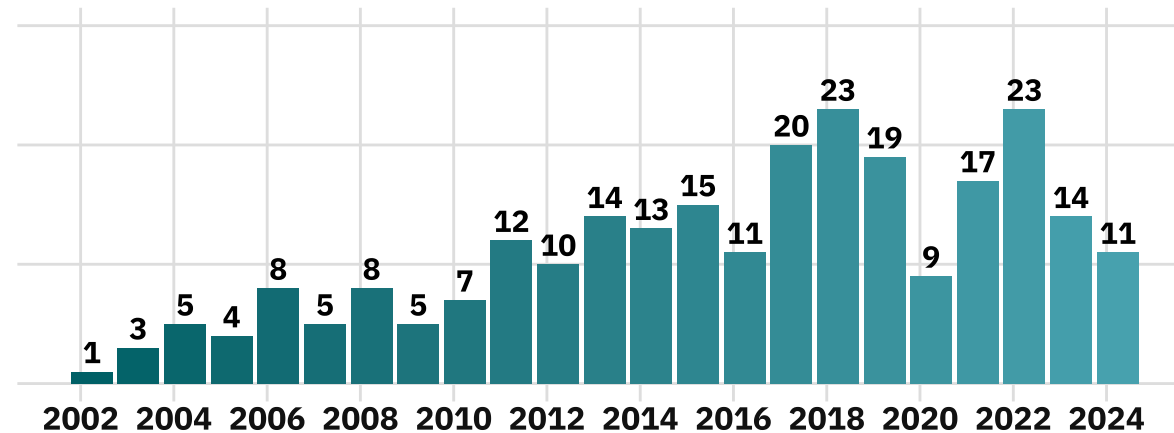
Cumulative purchase price paid

**82%**

Strategic corporate acquirers

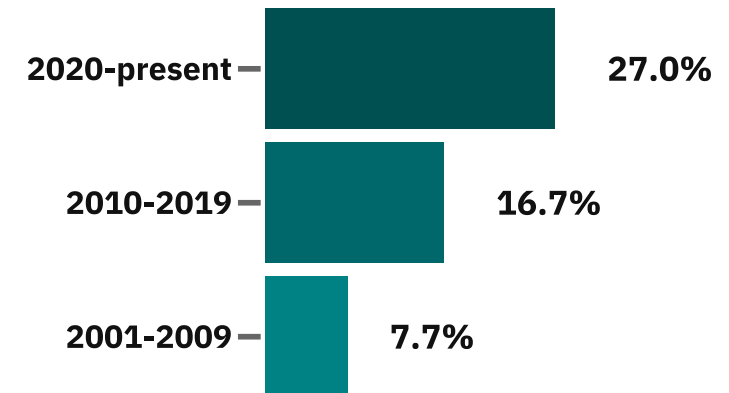
## Vision Tech M&A Transaction Count

2002-2024: total transactions: 257



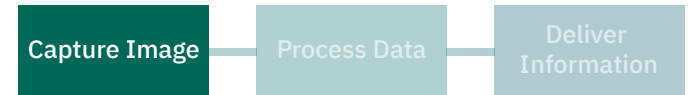
## Proportion of Financial Buyers

By 10 year cohort 2001-2024

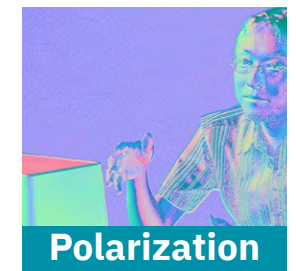
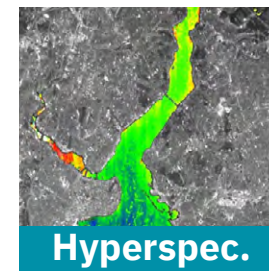
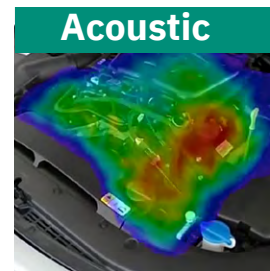
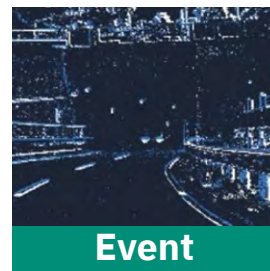
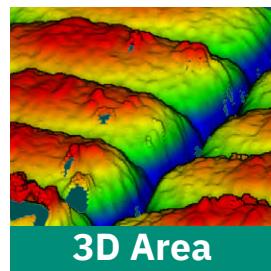
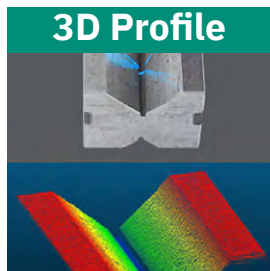
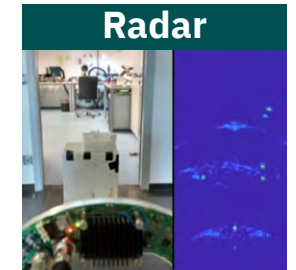
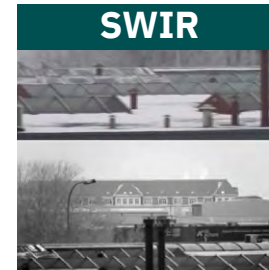
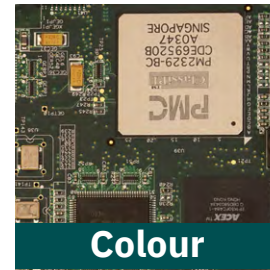
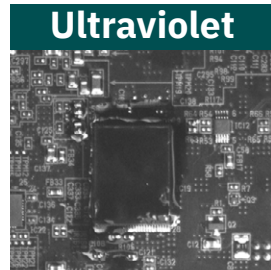
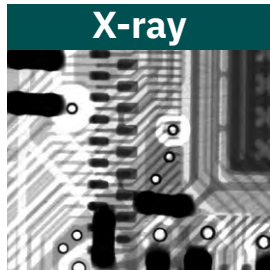


Indicators of a maturing yet strategically attractive market

# Increasing awareness of the value in additional imaging modes



## Extending across the electromagnetic spectrum



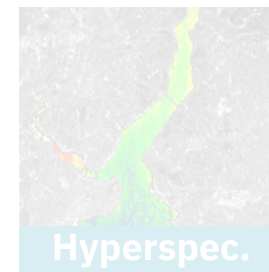
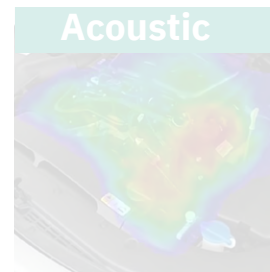
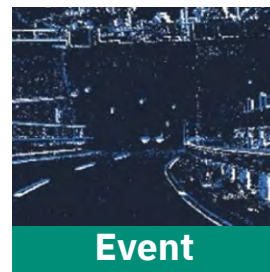
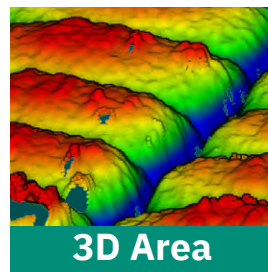
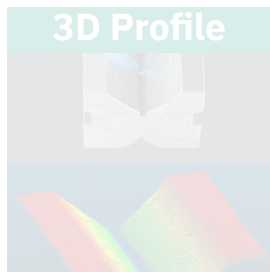
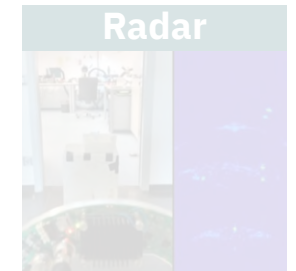
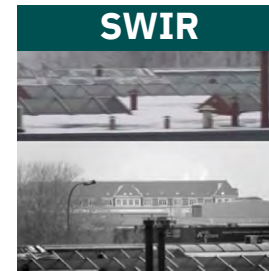
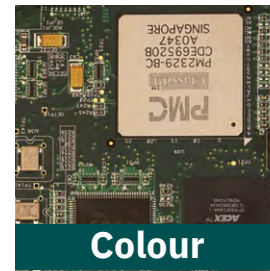
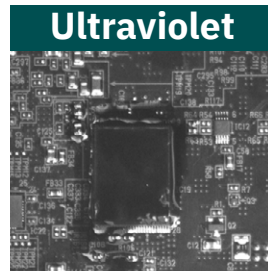
Non-intensity data types

Discrimination of light properties

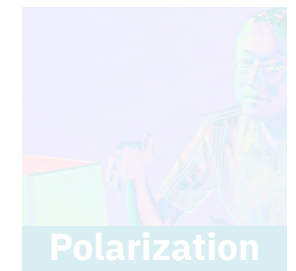
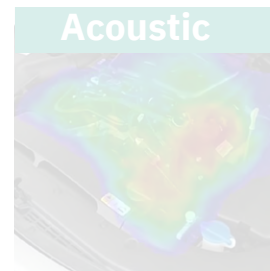
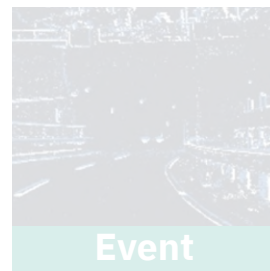
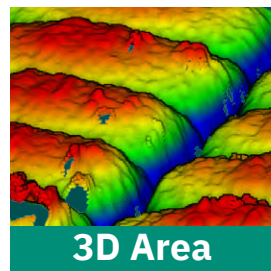
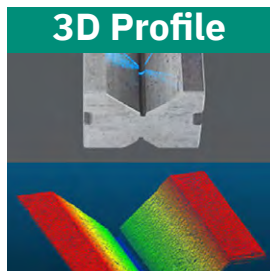
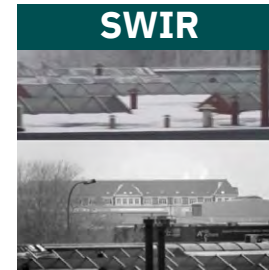
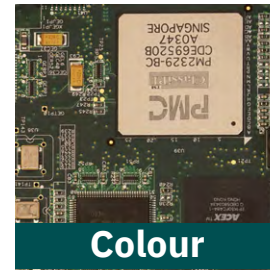
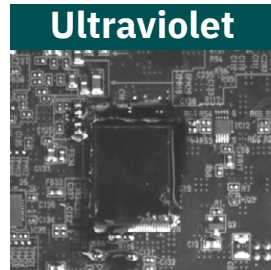
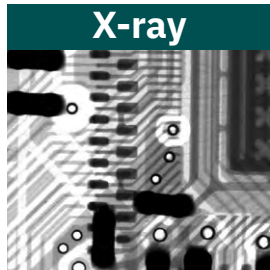
# Increasingly wide portfolio of imaging modes reflected by component and product suppliers



# SONY

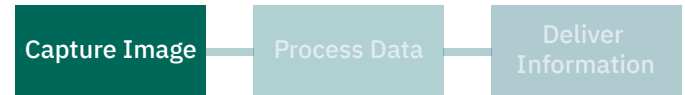
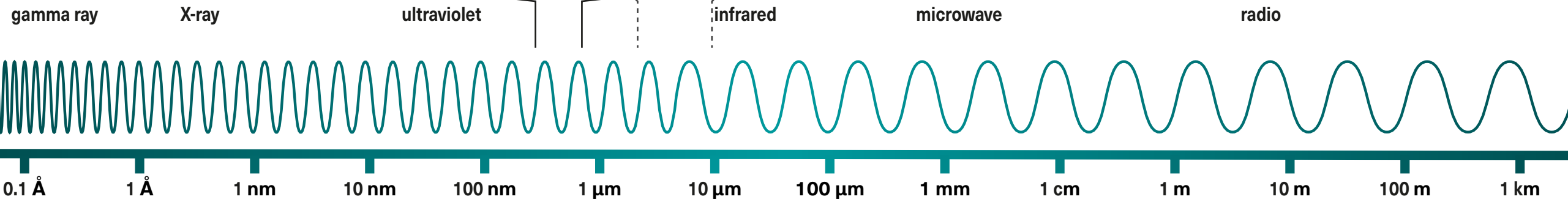
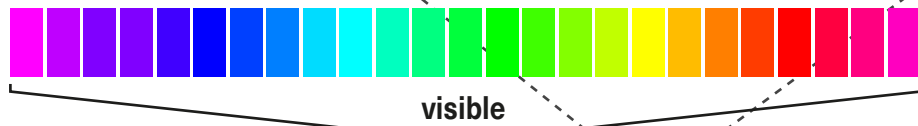
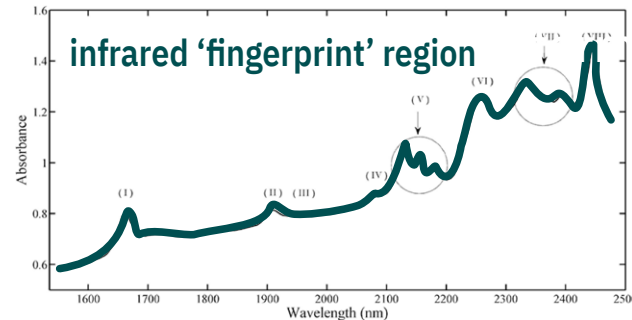


# Increasingly wide portfolio of imaging modes reflected by component and product suppliers



# Detecting outside the VIS-NIR remains costly – but reveals material properties

estimated > 95% of machine vision applications use visible wavelength band



100-500x



X-ray

3-8x

UV

1x

VIS

5-10x

SWIR

10-20x

MWIR

10-25x

LWIR

Comparative image sensor/detector prices relative to visible CMOS image sensor

# Vision AI – industry disruptor or new tool in the toolbox?

Capture Image

Process Data

Deliver Information



# Vision AI – industry disruptor or new tool in the toolbox?

Capture Image

Process Data

Deliver Information

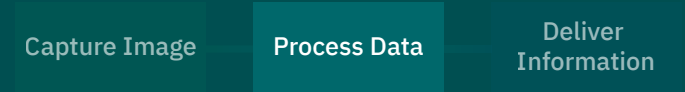
## AI machine vision



## Traditional machine vision



# Vision AI – industry disruptor or new tool in the toolbox?



## AI machine vision



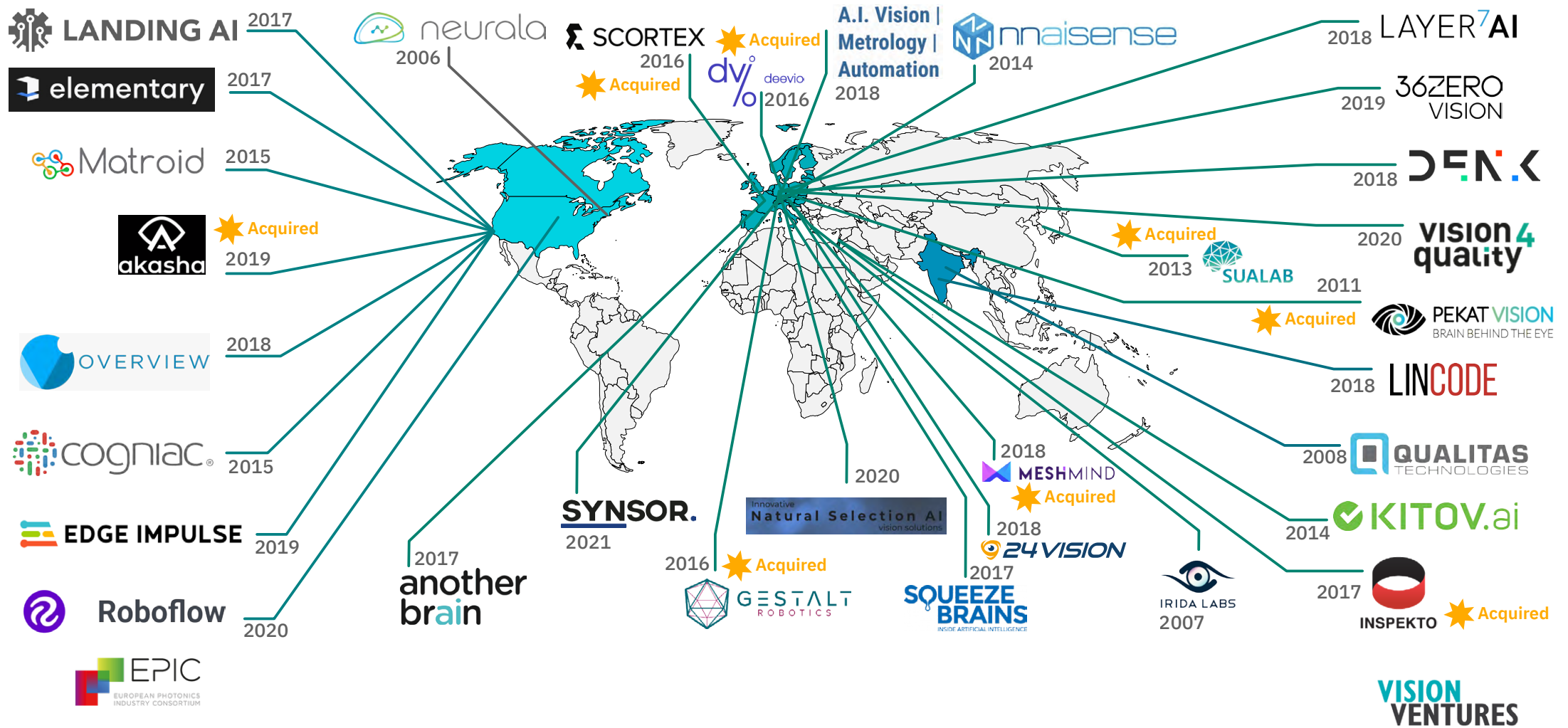
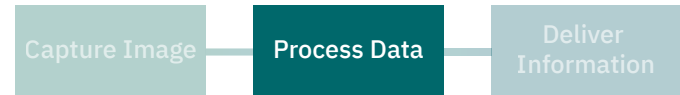
can be automated for operator

## Traditional machine vision

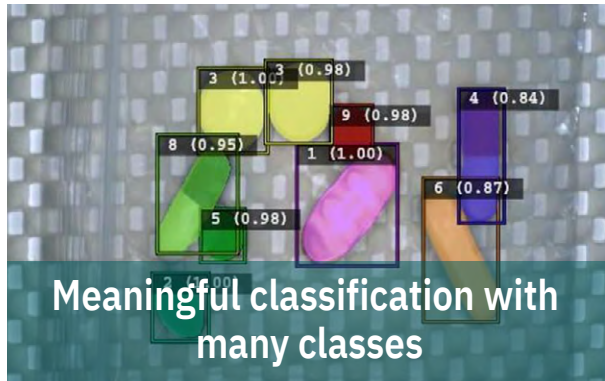
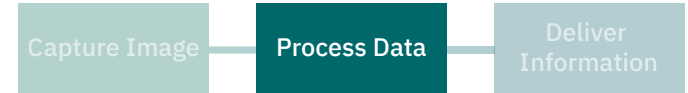




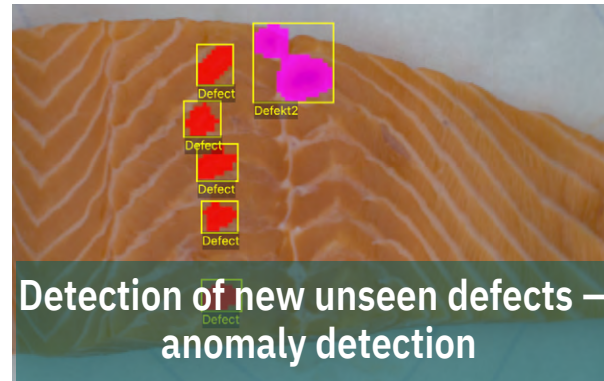
# Many Vision AI startups in the last decade – multiple acquisitions and large investments deployed



# Vision AI brings clear benefits but also has constraints



Meaningful classification with many classes



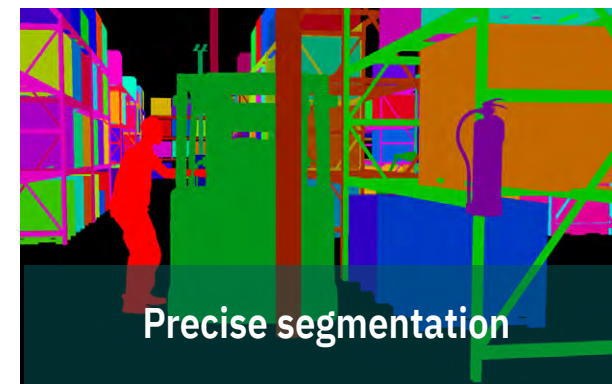
Detection of new unseen defects - anomaly detection



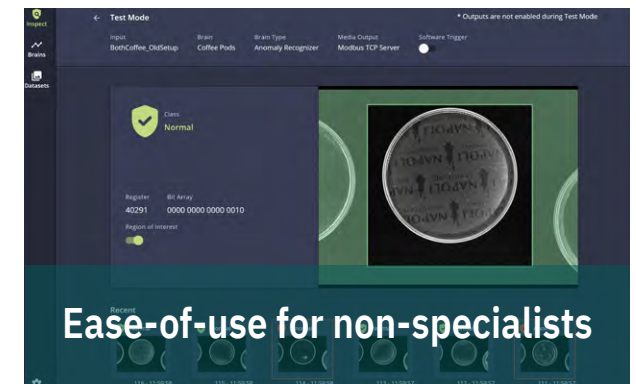
Unconstrained & ill-defined applications



Robust extraction from poor images - e.g. OCR codes



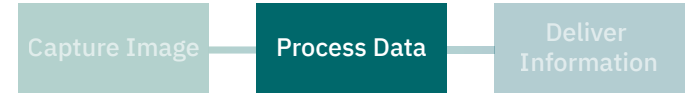
Precise segmentation



Ease-of-use for non-specialists



# Vision AI brings clear benefits but also has constraints



**Potential Constraints**

- Achieving performance better than state-of-the-art traditional vision
- Data scarcity and data variety in industrial environments
- Explainability and interpretation — why false positive/false negatives

**Market Response**

- Hybrid algorithms e.g. rule based defect detection, AI based classification
- Partial focus on new applications
- Synthetic data
- Domain-specific solutions
- Ongoing development

# 5G – modern connectivity with implications for machine vision system architectures



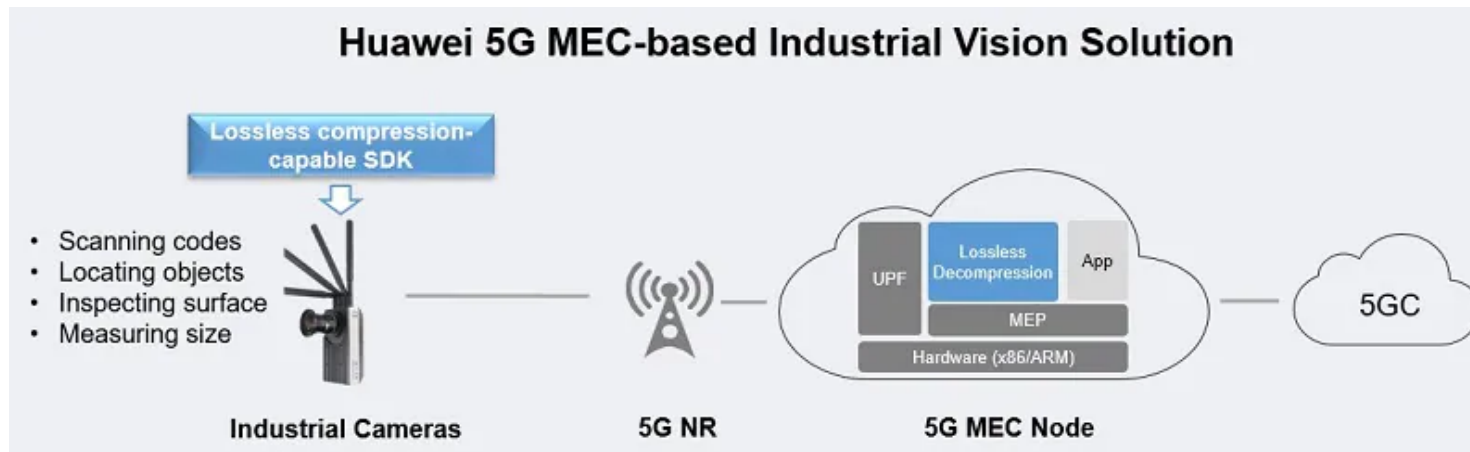
**Bandwidth** – Enables efficient transfer of large data types e.g. image data

**Latency** – Low and reliable latencies enable control applications

**Reliability** – Robust communication is critical for industrial adoption

**Scale** – Ability to connect massive amounts of devices (millions per sq. km)

**Wireless** – Simple installation, maintenance and updates



# Market Outlook

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2024 will be a challenging year for some vision companies depending on specific vertical exposure

Underlying demand **drivers for Vision Tech remain strong** — improved quality, better efficiency, additional insight, tracking and documentation

Ongoing **consolidation is balanced by continued innovation**, new technologies, and market entrants

Reducing cost & complexity of non-vision imaging opens **significant opportunities for innovation and growth**

Vision AI will continue to demonstrate value in applications — but technical competence is more widespread and **domain-specific approaches** may capture more value

Potentially strong impact from 5g — participation of telecoms companies and rising awareness of need for cybersecurity at device level

## Industry Trends

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