



Edge AI

CRESITT - 15 Octobre 2026

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Edge AI

- Introduction (who are we ?)
- What is Edge AI ?
- Use cases Examples
- Advantages of Edge AI
- Components offering for Edge AI
- Criteria of technology choice.



ARROW specialized in managing complexity for 90 yrs

Arrow Electronics guides innovation forward for over 220,000 leading technology manufacturers and service providers.

The ultimate technology enabler, Arrow develops technology solutions that improve business and daily life



1935
Arrow Radio
opens on Radio
Row in New
York City



Head Quarter
Denver,
Colorado

85+
Countries

20,000+
Employees

260
Sales Locations

41
Fulfillment & Value
Added Centers

Arrow Electronics, Inc.

A global technology provider of products, services and solutions

Serving original equipment manufacturers, and embedded solution providers.

Electronic Components

- Passives
- Electromechanical
- Connectors
- Semiconductors
- Embedded systems
- Services

Serving channel ecosystems of value-added resellers, system integrators, service providers, telcos, ISVs, developers and marketplaces.

Enterprise Computing Solutions

- Private cloud
- Hybrid cloud
- Multi-cloud
- Edge
- Platforms/marketplaces
- Channel services
- Financial services

Serving original equipment manufacturers, independent software vendors and system integrators.

Intelligent Solutions

- Design services
- Manufacturing services
- Fulfillment services
- Integration services
- Professional services
- Support services
- Product services
- Managed services

Arrow Components EMEA Facts

CUSTOMERS

40.000+

EMPLOYEES

3.500+

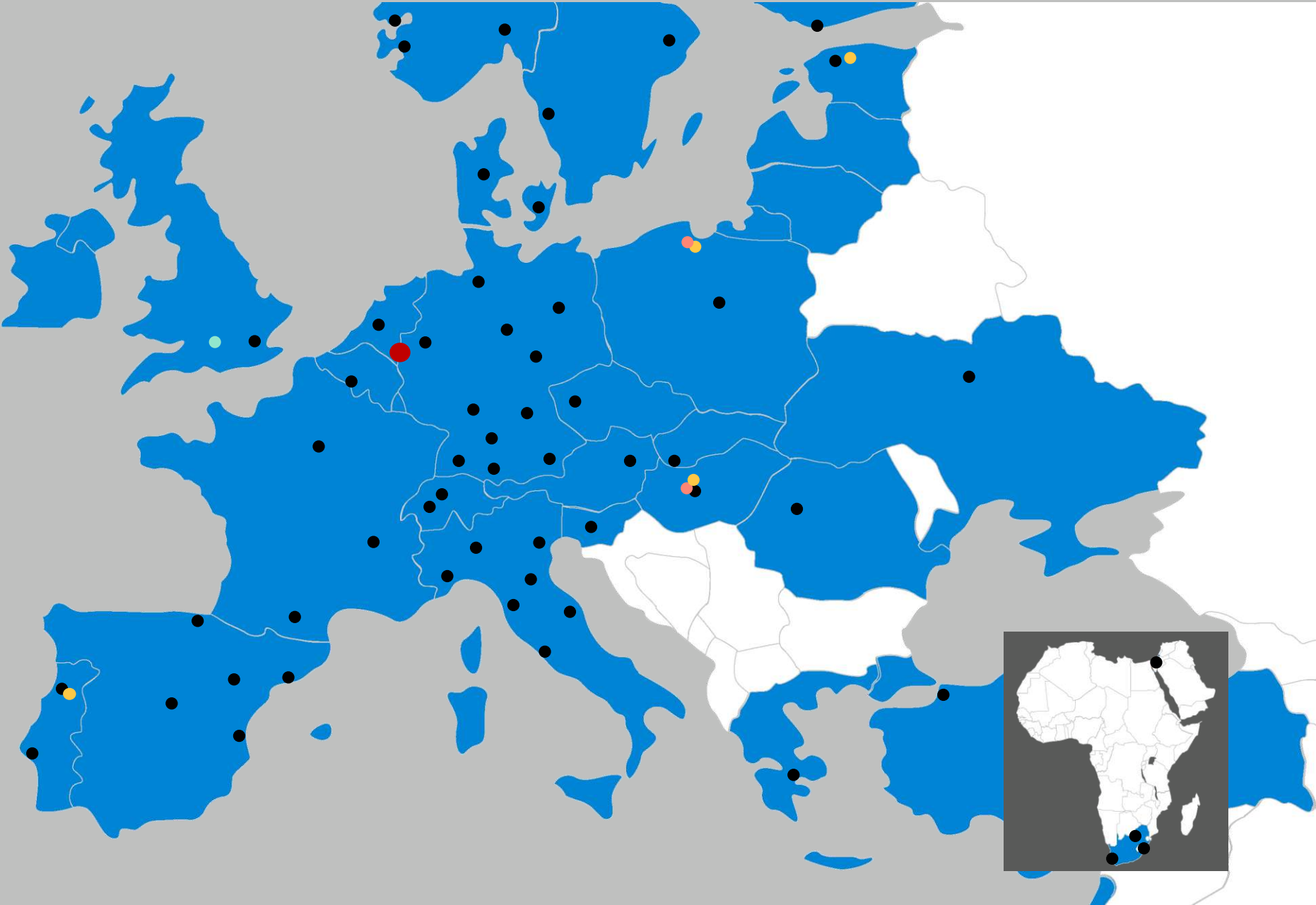
SUPPLIERS

500+

2025 EMEA REVENUE (USD)

\$5.6B

- Arrow Branch Office
- Global Engineering Services (GES)
- Arrow Power Supply Design Center
- Customer Service Center
- Primary Distribution Centre





What is AI at the Edge?

Why use AI?



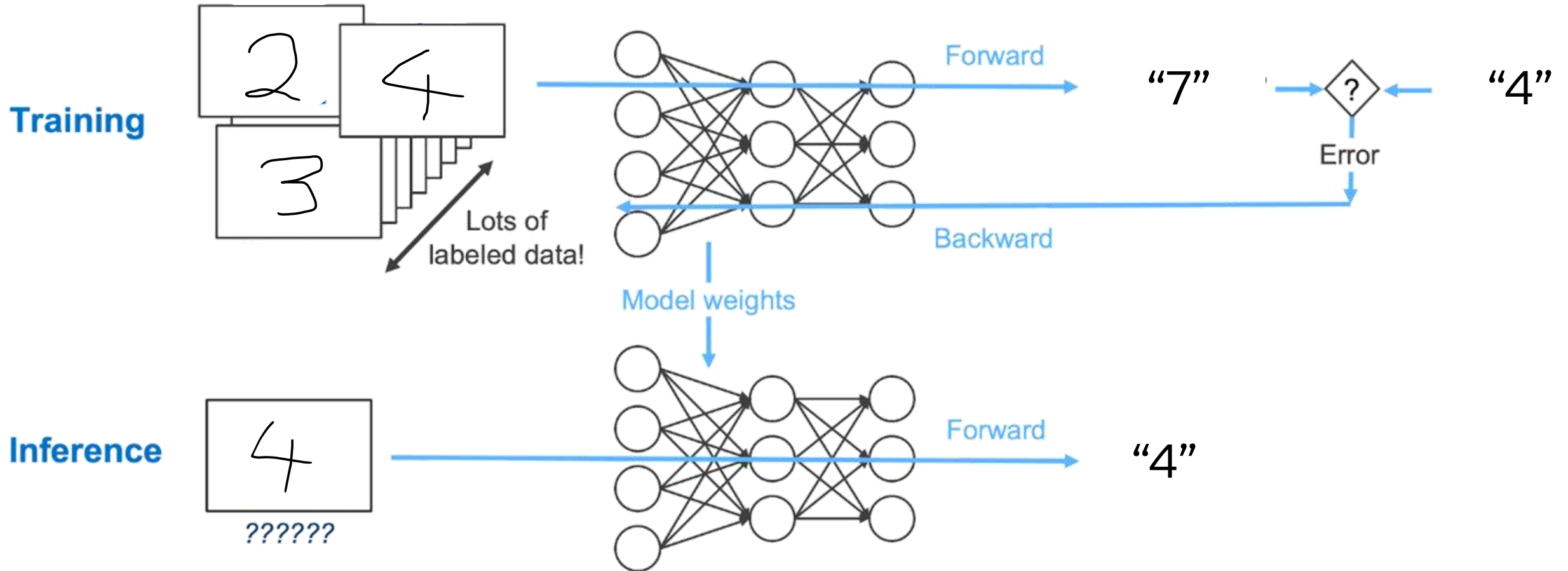
A black and white icon of a human head in profile, facing right. Above the head are two circles of different sizes, representing thought bubbles.

Deep Learning solves complex problems by using lots of data and compute resources rather than human derived algorithms

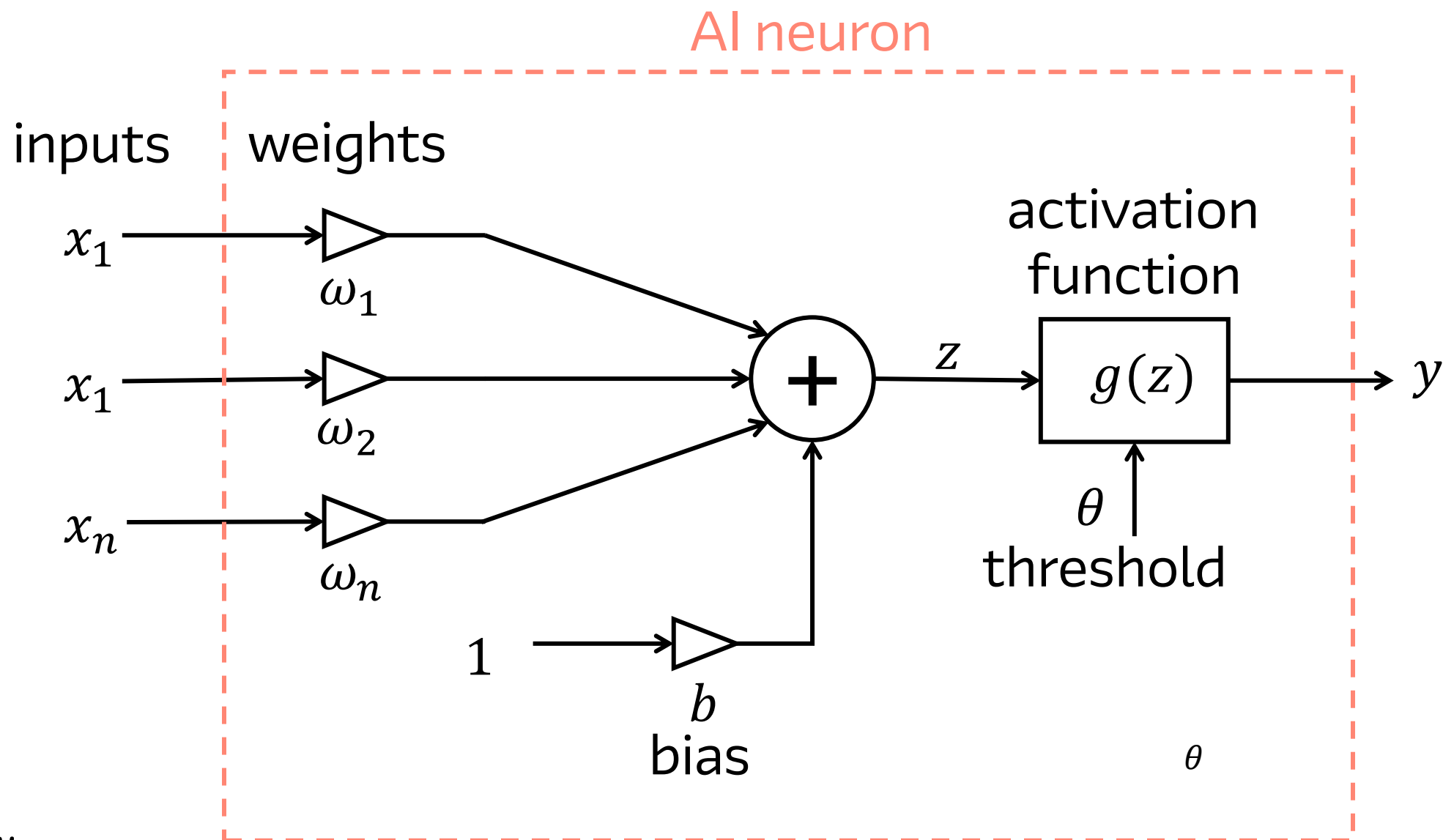
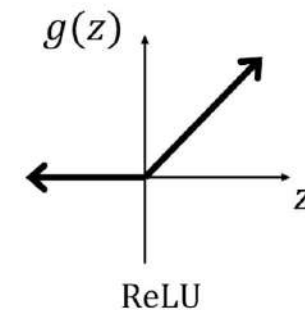
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Compute

Training and Inference

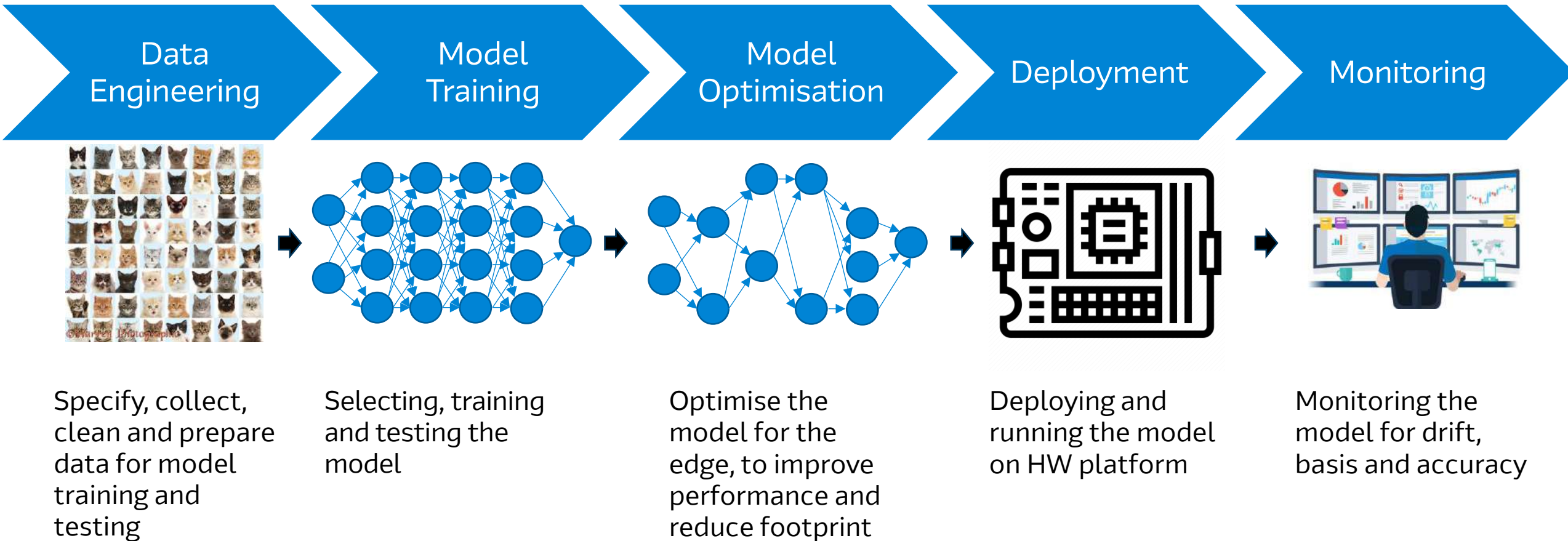


It's all just maths

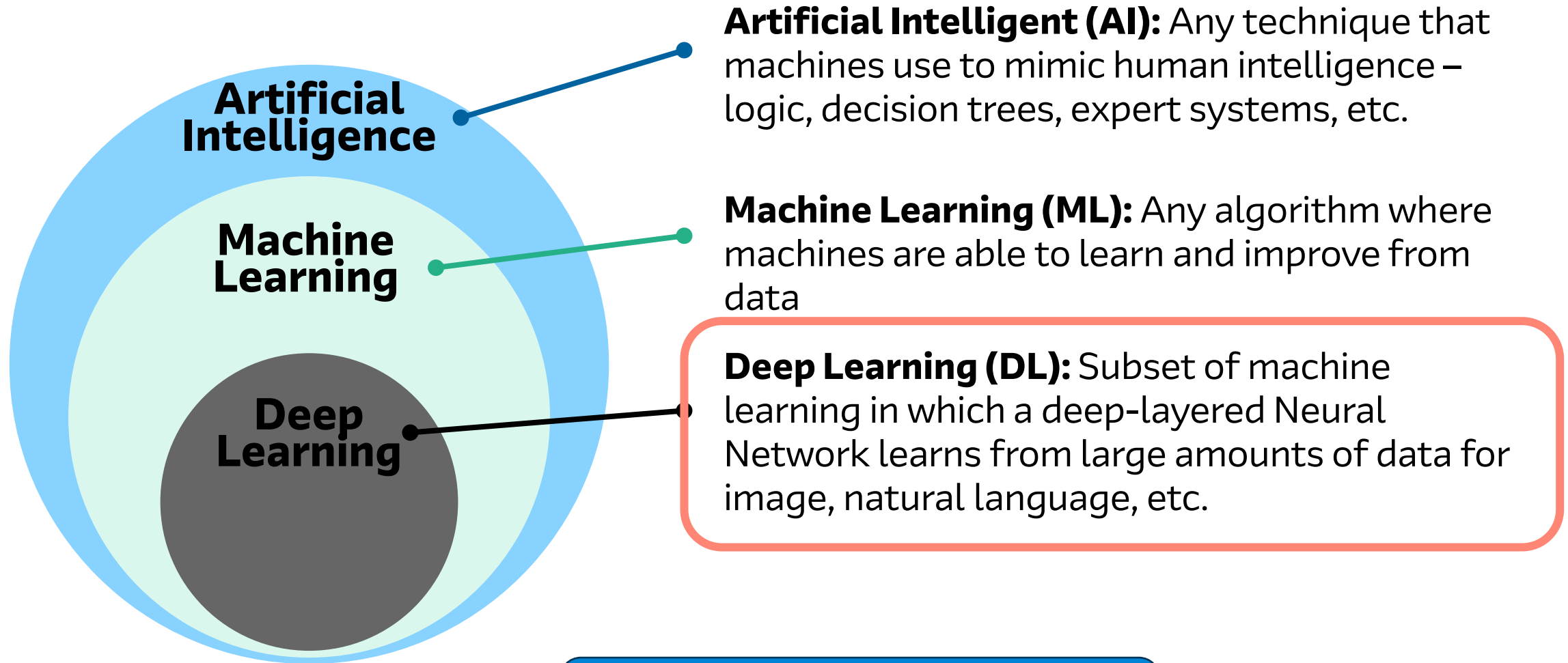


How? The AI/ML development Flow

The Five steps to realize AI



AI Terminology



Edge AI is primarily Deep Learning

AI in the Cloud *versus* Edge AI

AI in the cloud

The heavy lifting in AI

- **Training**
 - Unsupervised training
 - Easy access to and handling of training data
- **Deep Learning**
 - Large Language Models
 - Mixture of Experts
 - Convolutional Neural Networks
- **Large data sets**
 - Data from numerous sources
- **Drawbacks**
 - Long latency
 - Requires data transfer



Edge AI

Where the rubber meets the road

- **Light models**
 - Models can be trained and optimised in the cloud – then deployed on the edge
 - AI MCUs enable simple, low-cost AI
- **Heavy models**
 - Edge AI no longer limited to tiny models
 - LLMs can run on powerful AI modules
- **High security**
 - Complete control over data – e.g. confidential image information
- **Drawbacks**
 - The computational power does have a limit
 - Infrastructure for integrating external data



Why the Edge?



Ultra low latency - real time!



Resilient to loss of connectivity



Enhanced privacy & security



Reduced data transmission



Reduced power



Edge AI use cases by 'sense'

Artificial Intelligence will be everywhere!



See

- Object detection
- Traffic Control
- Face recognition
- Security camera
- Retail – Self service
- Agriculture robots
- Autonomous machines



Hear

- Voice control
- Sound identification
- Sound analysis
- Hearing aid



Feel

- Robot arm
- Industrial sensing
- Predictive maintenance
- Medical sensing

... And many more!

Edge AI Segments / Applications

Edge AI will transform many industries



Industrial automation/
robotics



Autonomous Machines/
AMR incl. drones



Surveillance and
Security



Agriculture



Retail



Smart Cities

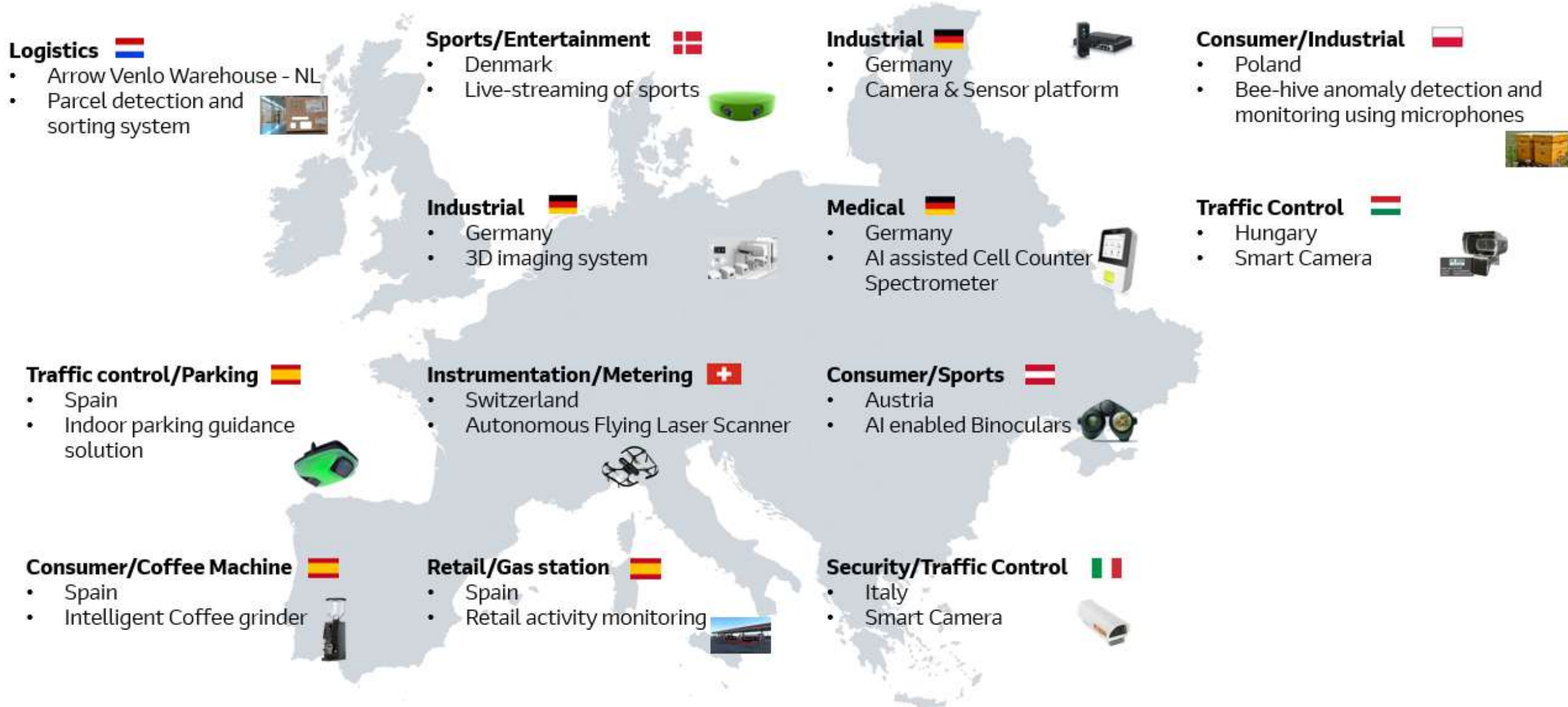


Healthcare/Medical



Home/Consumer

Edge AI projects across multiple segments and applications all over Europe



Hardware Target for Neural Network inference

An NPU (Neural Processing Unit) is dedicated hardware that is very efficient at AI operations

- Provides higher performance
- For less energy

Microcontroller with NPU vs Microprocessor MPU

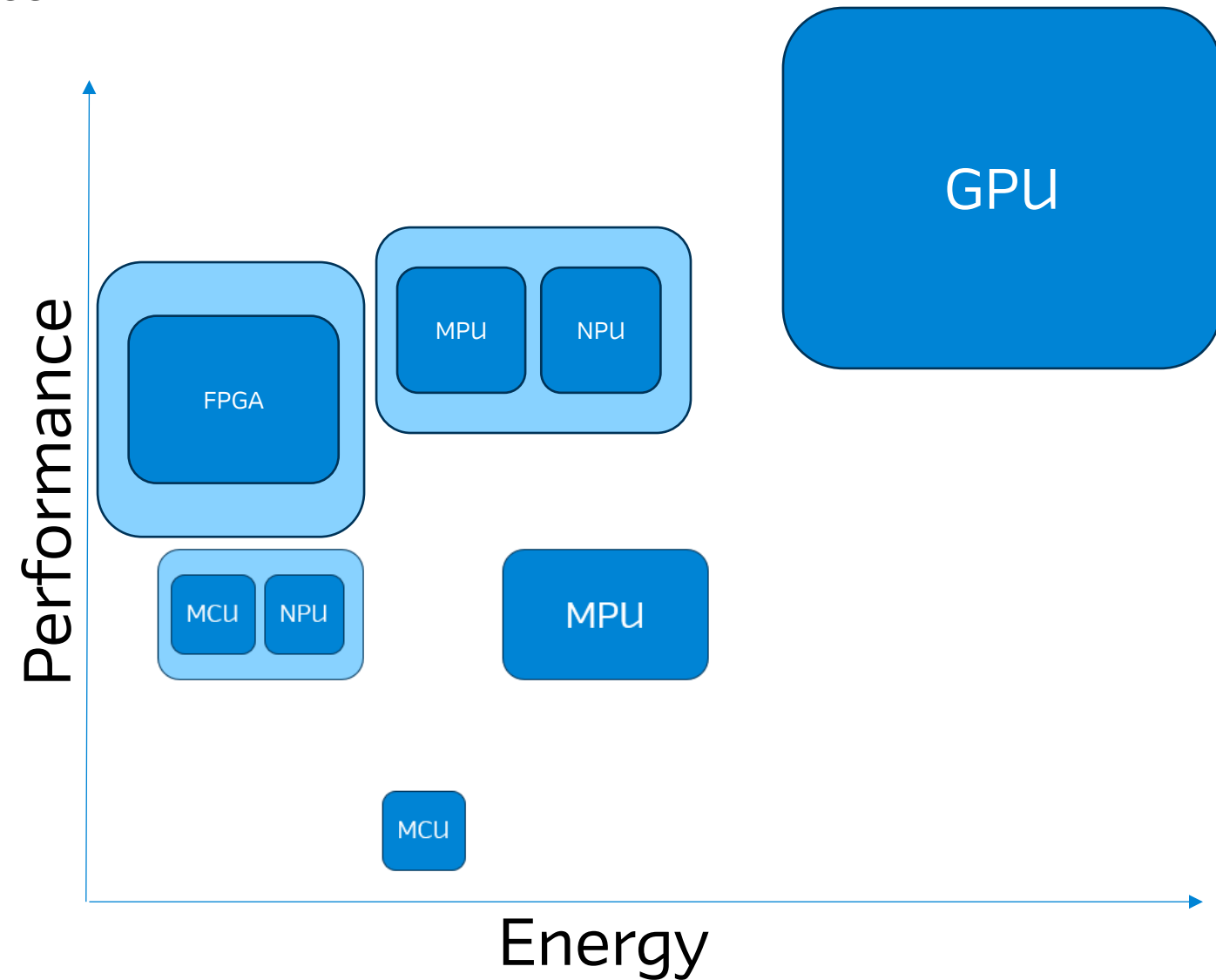
- Similar AI performance
- Less power
- Less memory
- Lower total BOM cost

Versus Programmable Logic (FPGA) with configurable NPU

- Optimized AI performance
- Low power
- Flexibility of the Programmable Logic

Versus GPU

- High End solutions for high performance needs



High Density FPGAs and High End GPU / NVIDIA

MPU with NN accelerator

FPGAs

MPU, MCU territory

Less than 50 GOPs

- Person presence
- Hand writing
- Reading labels
- Reading barcodes
- Basic image detection
- <5 fps is fine
- BOM < \$25

<1W to few Watts

50 – 250 GOPs

- Single CNNs
- Person counting
- Electronic Fence
- Reading Labels
- Facial Recognition
- <10-15 fps is fine
- BOM < \$100
- Not FPGA sockets unless
scope for functional
integration

<5 W to 10W+

250 – 2500 GOPs

- Multiple CNNs
- + face, emotions, age
- + thermal sensors
- + optical inspection
- Distributed ADAS
 - Driver Monitoring
 - BlindSpot
- Centralized ADAS
 - Autopilot

>5 W to >20W+

> 10 TOPs

(up to 275 TOPs for NVIDIA Orin)

- Server grade
- 1000 of classes
- Large workloads
- SIRI, Cortana, Ok-Google
- Search Engines
- Predictive Maintenance
- Max performance
desired
- BOM in \$'000

40W and more



xG24



PSOC

PSOC
EDGE



CrossLink
CertusPro

Avant



SAM
D/A

Polarfire



ISM

STM32

STM32
N6

MP2



MCX-N

iMx 8+, 9

iMx RT



Just acquired by AD

Ensemble

Balletto



Arria

Agilex



QCS6450

QCS8250



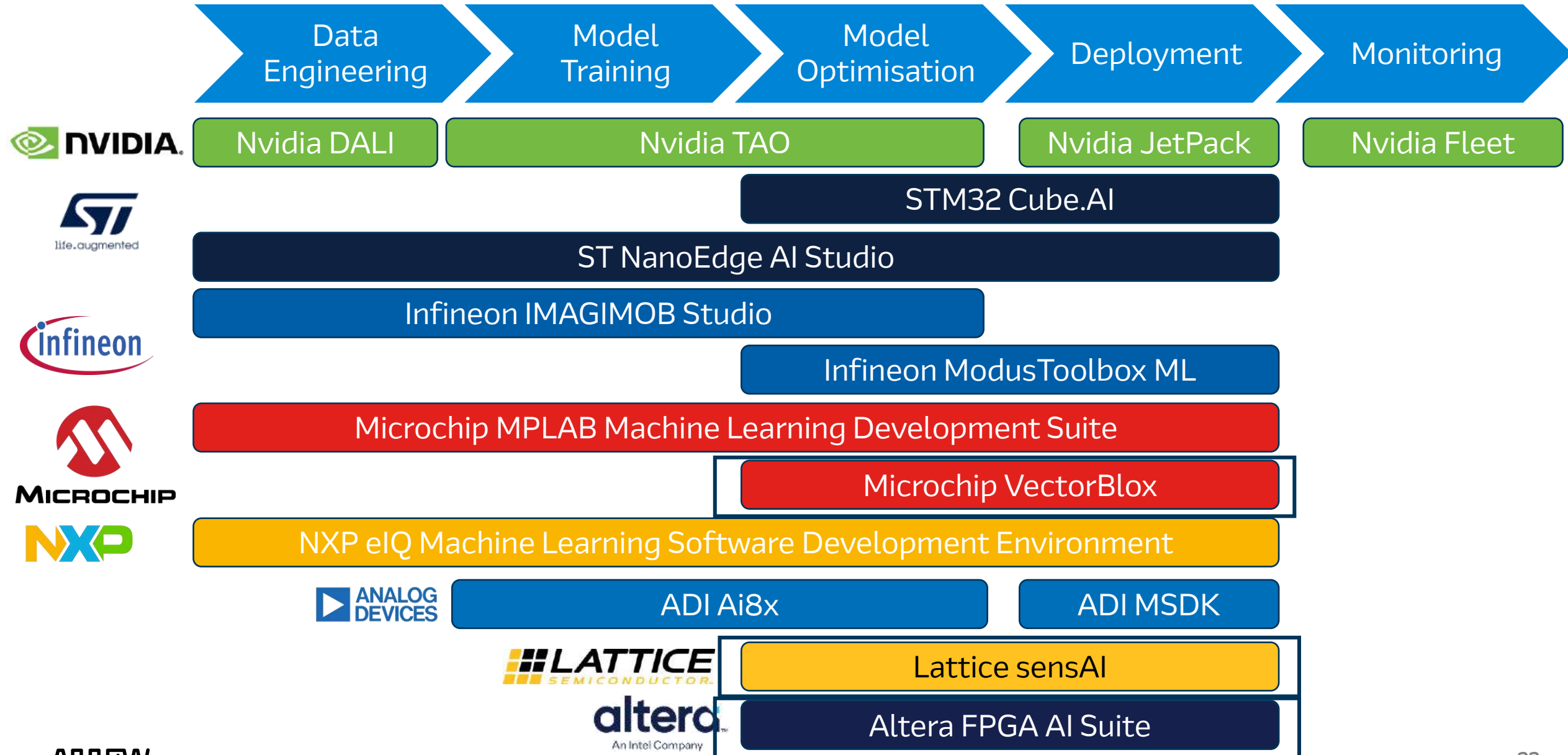
MLSoC



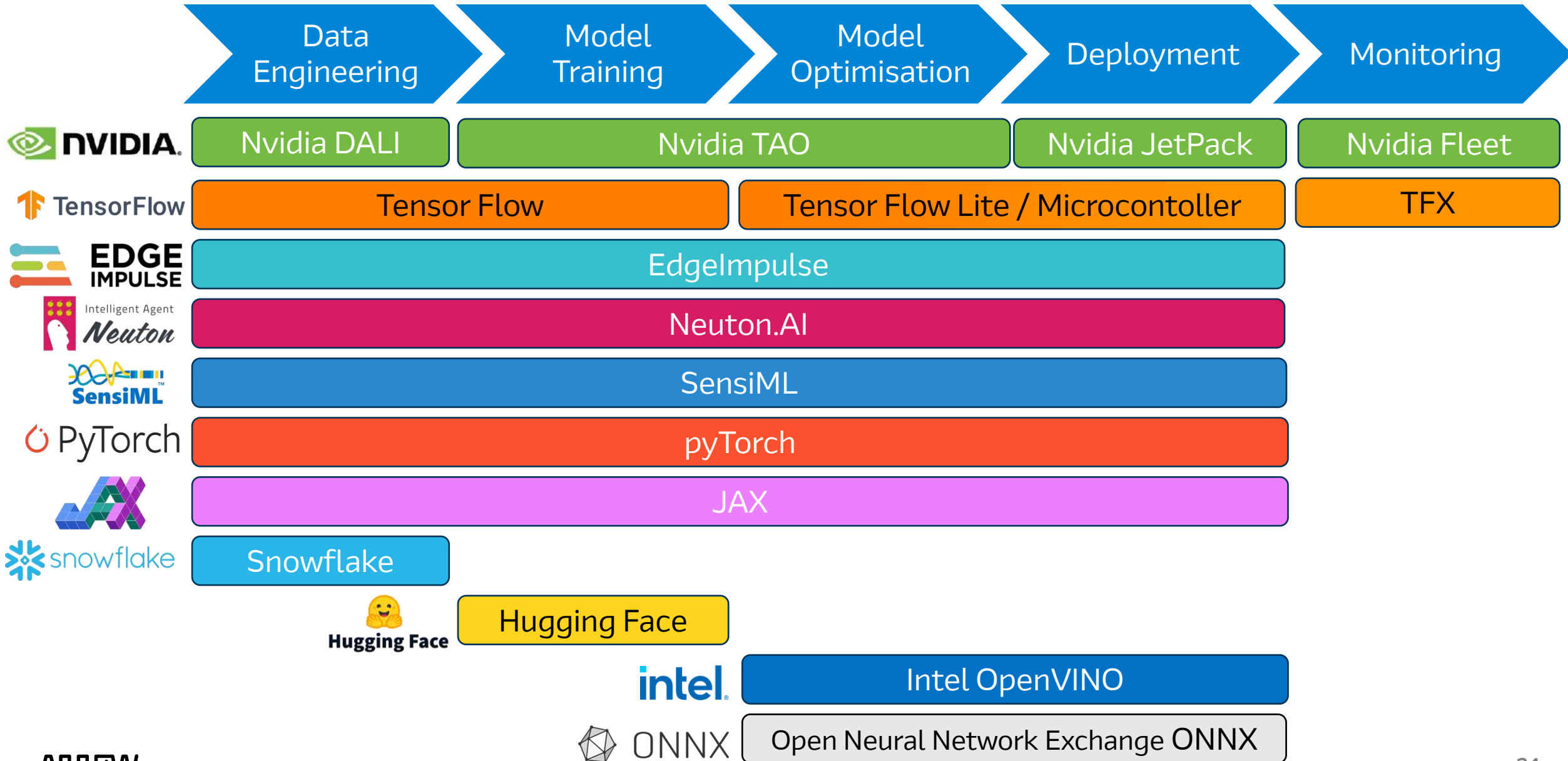
Jetson Nano

Jetson Orin

Supplier Software Tools

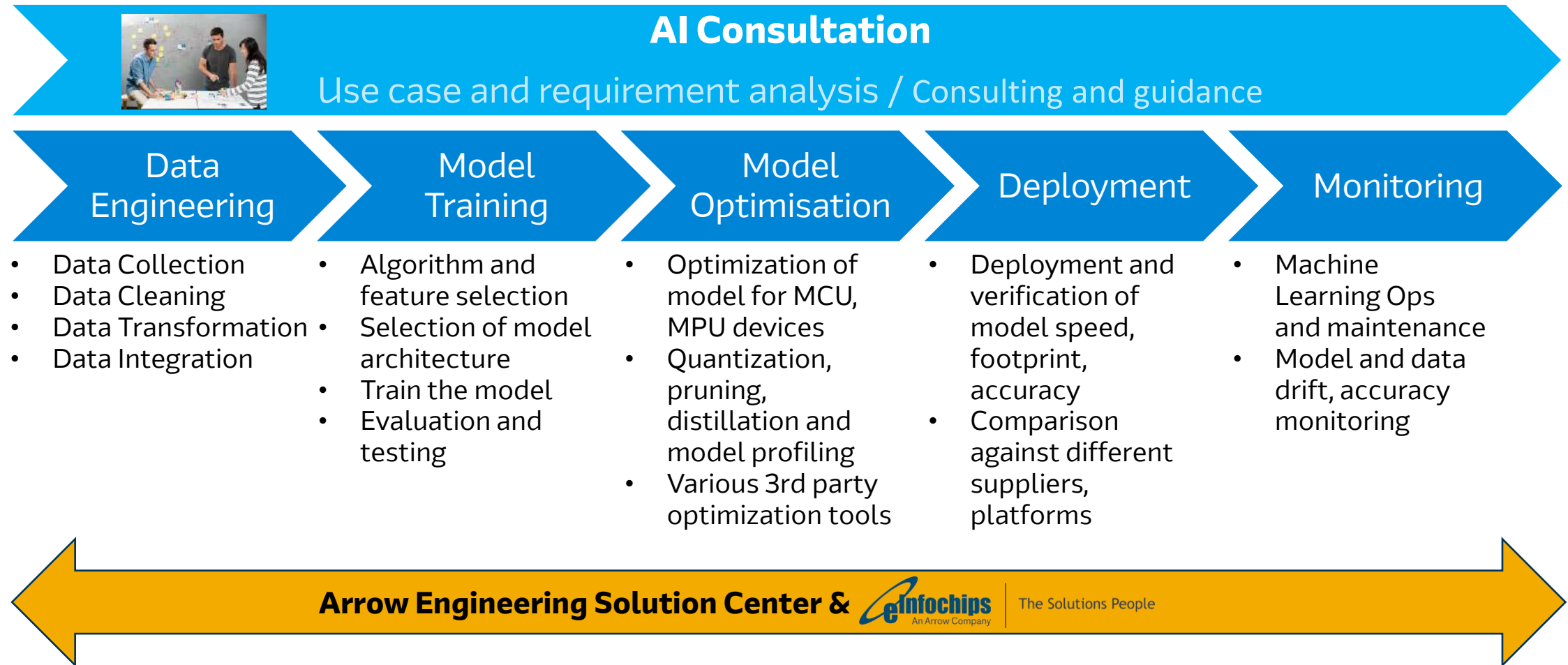


Hardware Agnostic Software



Arrow Edge AI Engineering Services

Complete end-to-end solution development, from **idea or business need** to product



Have you considered AI at the edge?

If the answer is "yes" to one or more of below questions you probably should!

1. Are you currently using Artificial Intelligence (AI) technologies in your business or products?
2. Do you require immediate decision-making capabilities that cannot depend on sending data back and forth to a central server?
3. Are you interested in reducing your reliance on cloud-based AI services and minimizing costs?
4. Do you have a large amount of data that needs to be processed in real-time?
5. Do you operate in an environment with limited or unreliable network connectivity?
6. Are you looking for AI solutions that can be deployed directly on edge devices, such as sensors, cameras or drones?
7. Do you have concerns about data privacy and security?
8. Is power consumption a key factor for your application ?



Merci !



Five Years Out