WEBINAR 5

PRESENTS

ARTIFICIAL INTELLIGENCE IN AUTOMOTIVE & MOBILITY

AN OVERVIEW

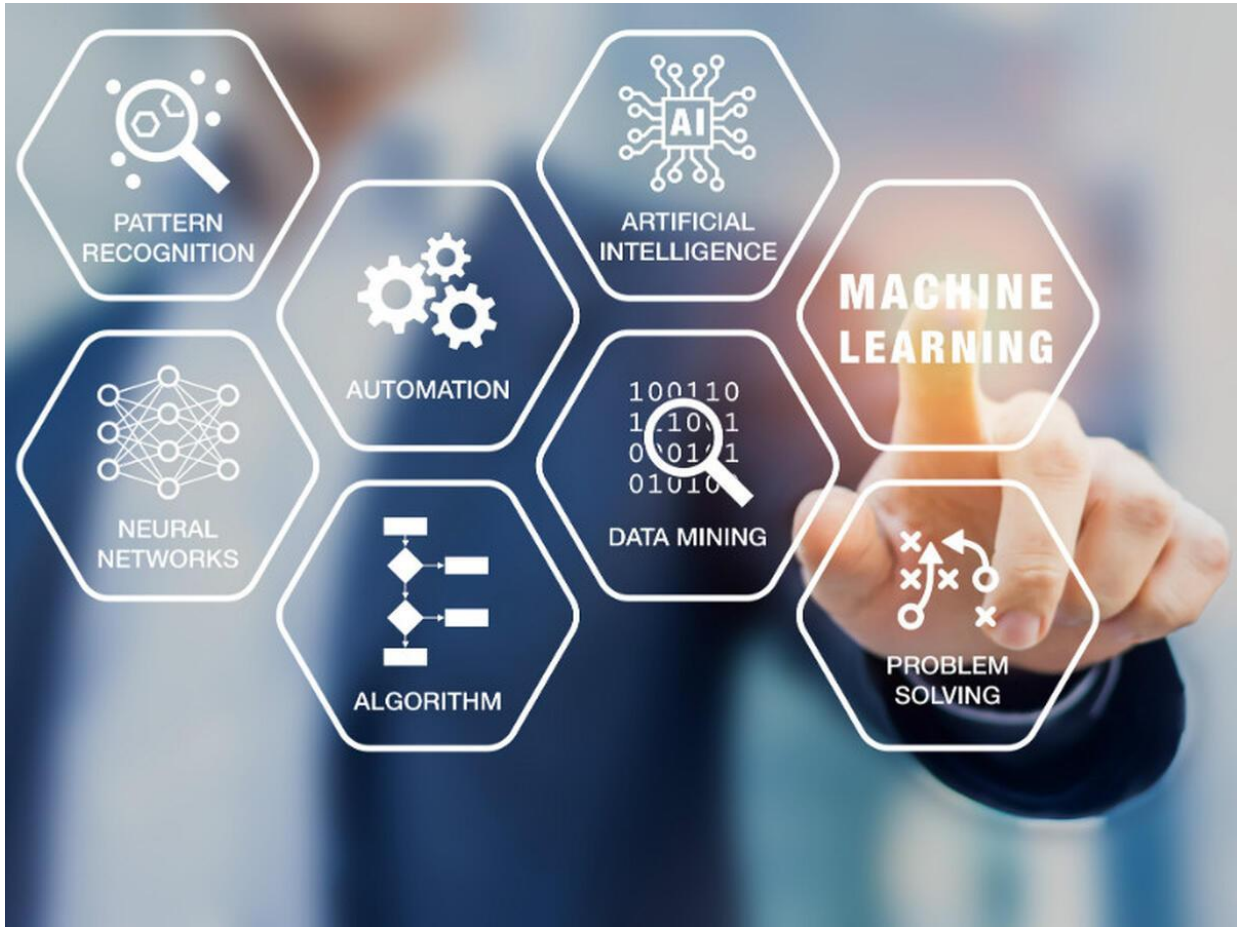
IN COLLABORATION WITH

Time Of Sports®

AGENDA

- Introduction to AI, ML & DL
- AI in AutoMotive & Mobility
- Possible Use Cases of AI in NXP AIM Challenge

Introduction to Artificial Intelligence and Machine Learning

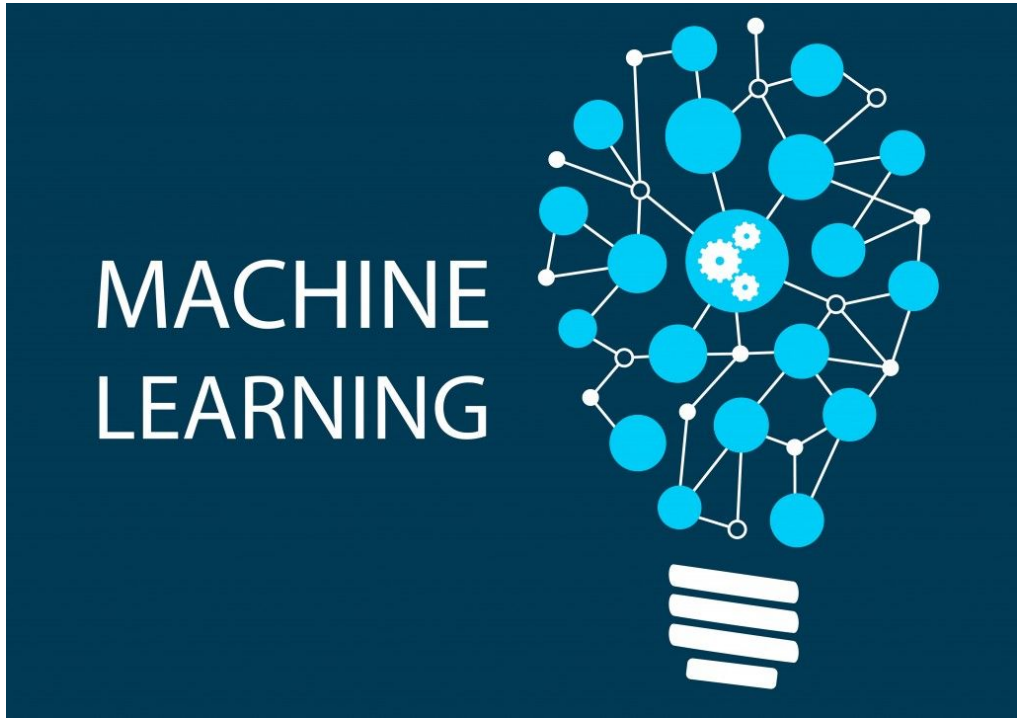


What is AI?

Artificial Intelligence :
Transforming the Nature of Work, Learning and Learning to Work

- **Artificial Intelligence (AI)** is popular branch of computer science that concerns the building intelligent smart machines capable of performing intelligent tasks.
- With rapid developments in deep learning and machine learning, the tech industry is transforming radically.

What is Machine Learning?



- **Machine Learning(ML)** is a type of AI that enables machines to learn from data and deliver predictive models.
- Machine Learning is not dependent on any explicit programming but the **data** fed into it.
- Based on the data you feed into machine learning algorithm and the training given to it, the output is delivered.
- A predictive algorithm will create a predictive model.

What is Deep Learning?

- **Deep Learning(DL)** is a subfield of Machine Learning that is concerned with algorithms inspired by the brain's structure.
- A computer model can be taught using Deep Learning to run classification actions using pictures, texts or sounds as input.

Artificial Intelligence Vs Machine Learning Vs Deep Learning

Artificial Intelligence

- AI originated around 1950s
- AI represents simulate intelligence in machines
- AI is a subset of data science
- Aim is to build machines which are capable of thinking like humans

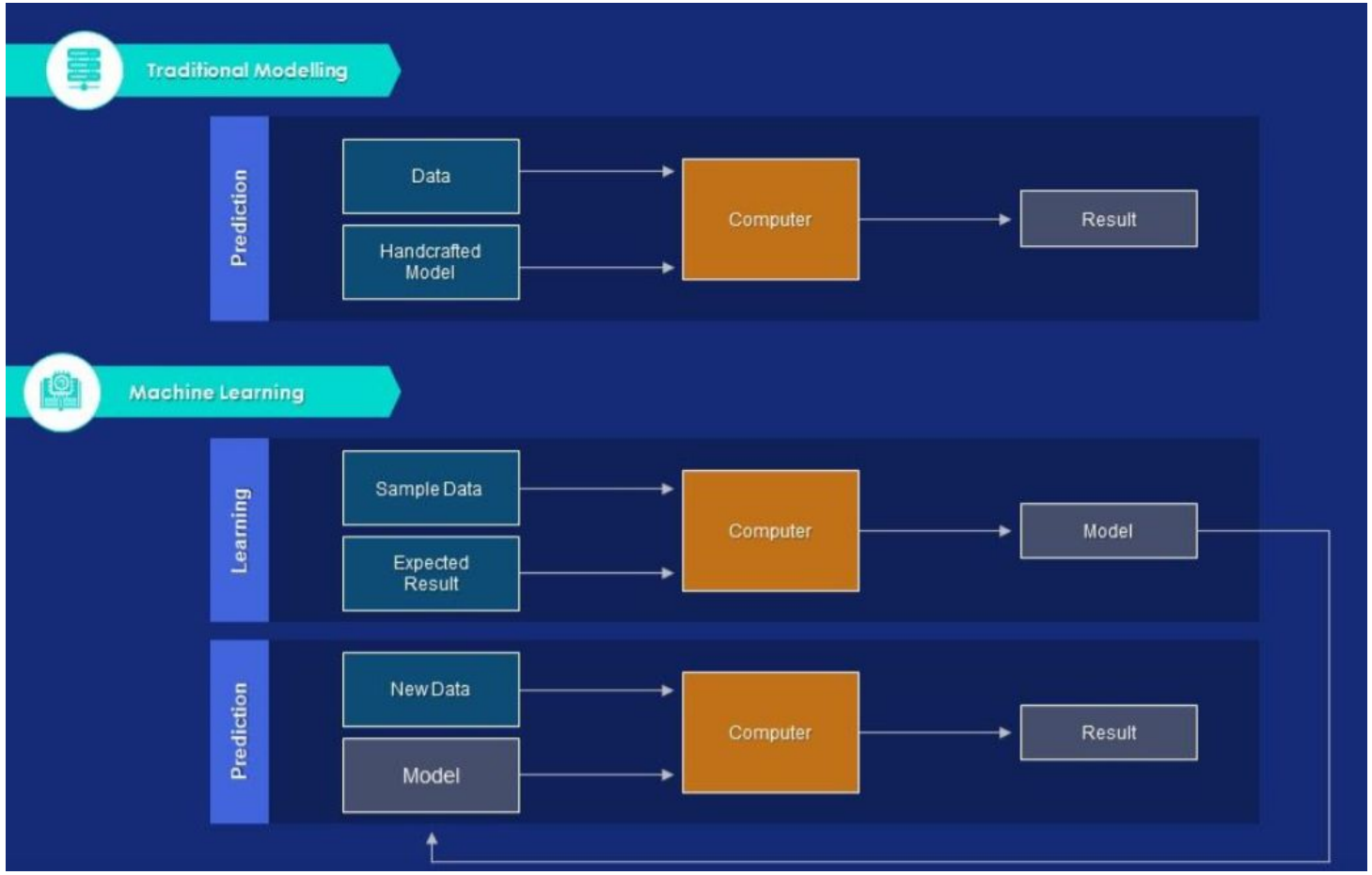
Machine Learning

- ML originated around 1960s
- Machine Learning is the practice of getting machines to make decisions without being programmed
- Machine Learning is a subset of AI & Data Science
- Aim is to make machines learn through data so that they can solve problems

Deep Learning

- DL originated around 1950s
- Deep Learning is the process of using artificial neural networks to solve complex problems
- Deep Learning is a subset of Machine Learning, AI & Data Science
- Aim is to build neural networks that authentically discover patterns for feature detection

Machine Learning Vs Traditional programming

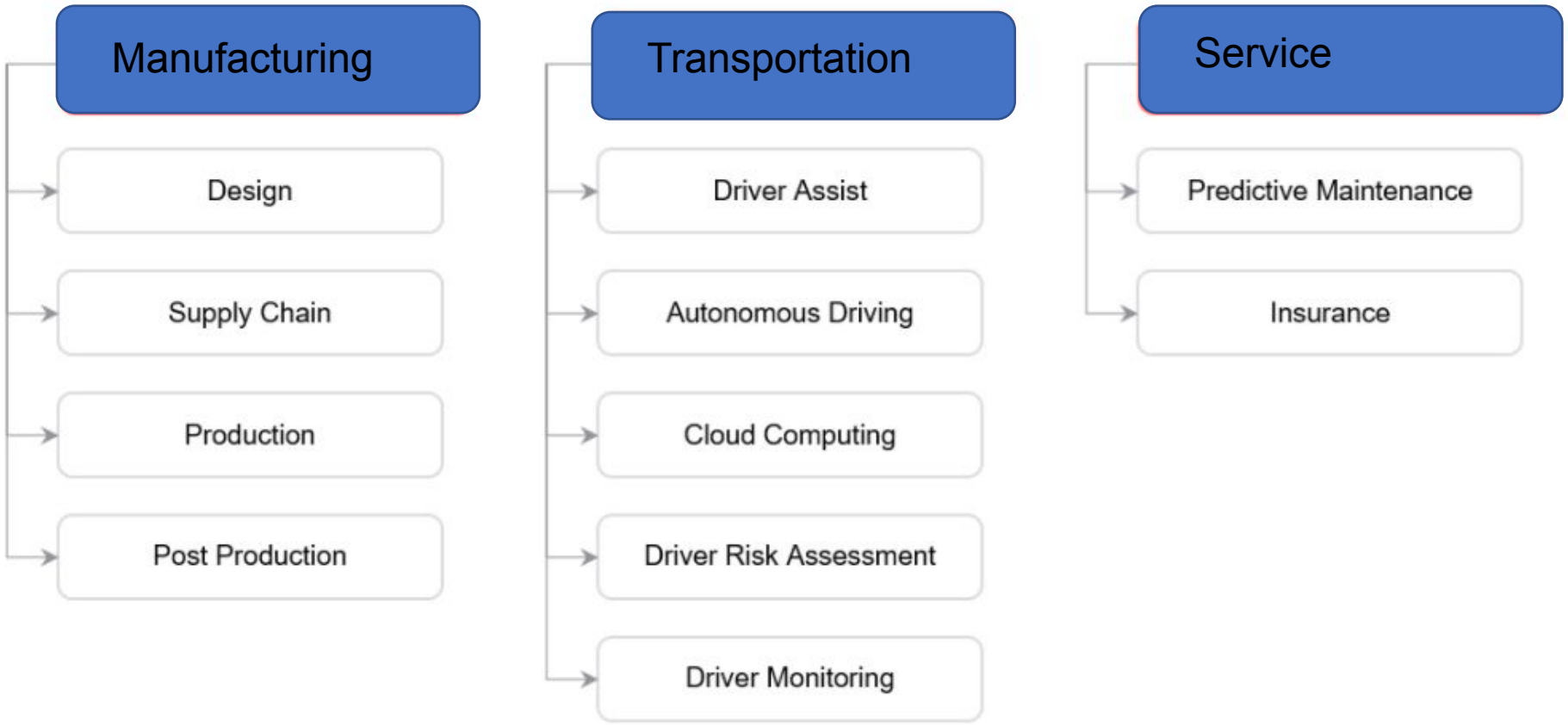


AI & ML in Automotive & Mobility

Industries based on their maturity level for Artificial Intelligence Adoption

Source: FutureBridge Analysis and Insights

AI in Automotive value chain



Use Cases of AI in Automotive

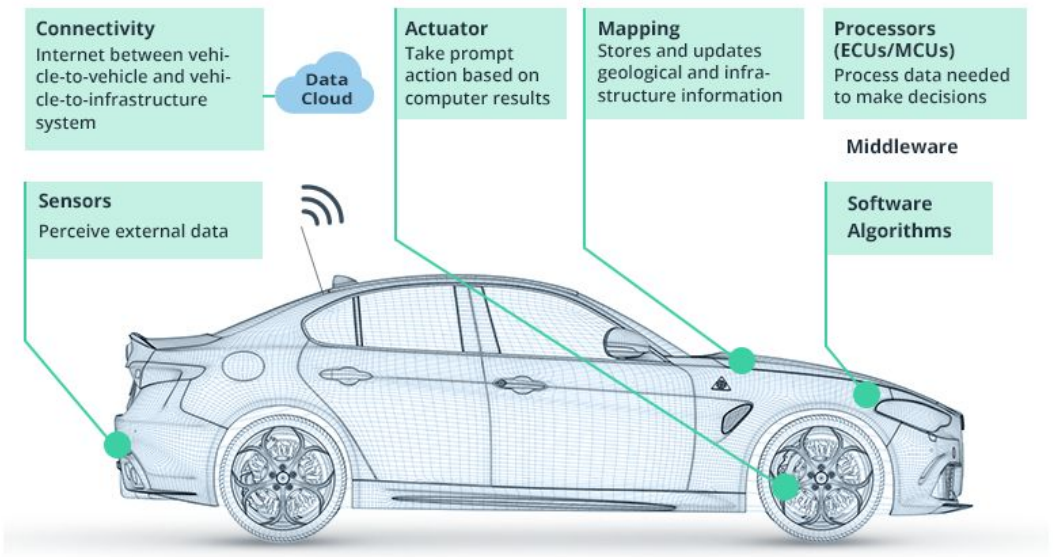
- Autonomous driving
- Connected vehicles
- Mobility as a Service
- Smart manufacturing
- Services

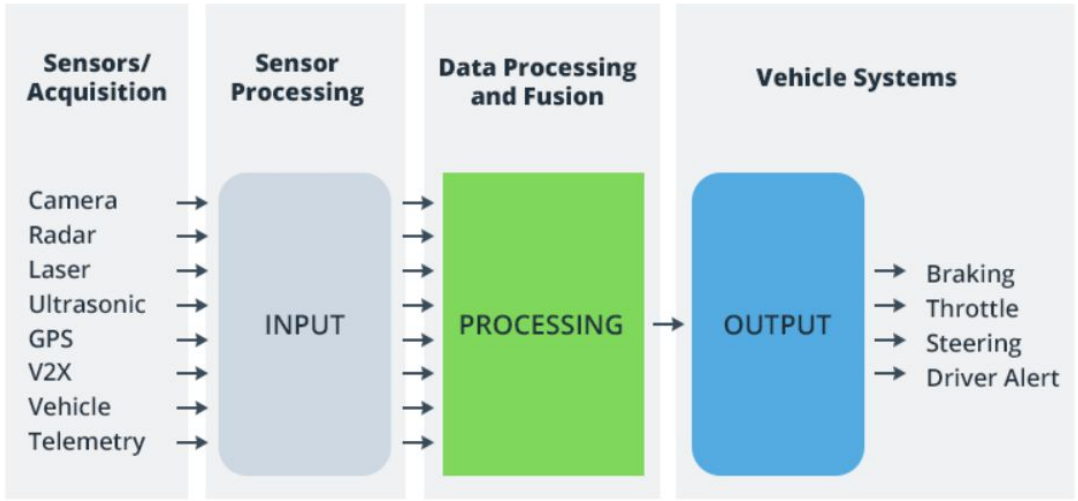
Autonomous Driving

STAGES OF AUTOMATION IN AUTOMOTIVE

Level 0	Level 1	Level2	Level3	Level4	Level5
No Automation Fully operated by humans	**Driver Assistance** Vehicle is controlled by human with driving assistance feature to help in steering and acceleration/deceleration	**Partial Automation** Human control is reduced with automated system controls steering and acceleration at the same time	**Conditional Automation** Human will respond and intervene when needed all other time vehicle is controlled by automated system	**High Automation** In defined environment performance of vehicle is fully controlled by autonomous driving system	**Full Automation** In all environment performance of vehicle is fully controlled by autonomous driving system

An Example from ADAS : System Design in Automotive





Connected Vehicles

Mobility

The machine learning in mobility-as-a-service models are significantly different than those in autonomous driving:

- Predict customer demand
- Optimize fleet efficiency and minimize customer wait times
- Dynamically set prices in response to demand
- Ensure passenger physical security
- Protect customer data, prevent fraud, and balance privacy versus convenience

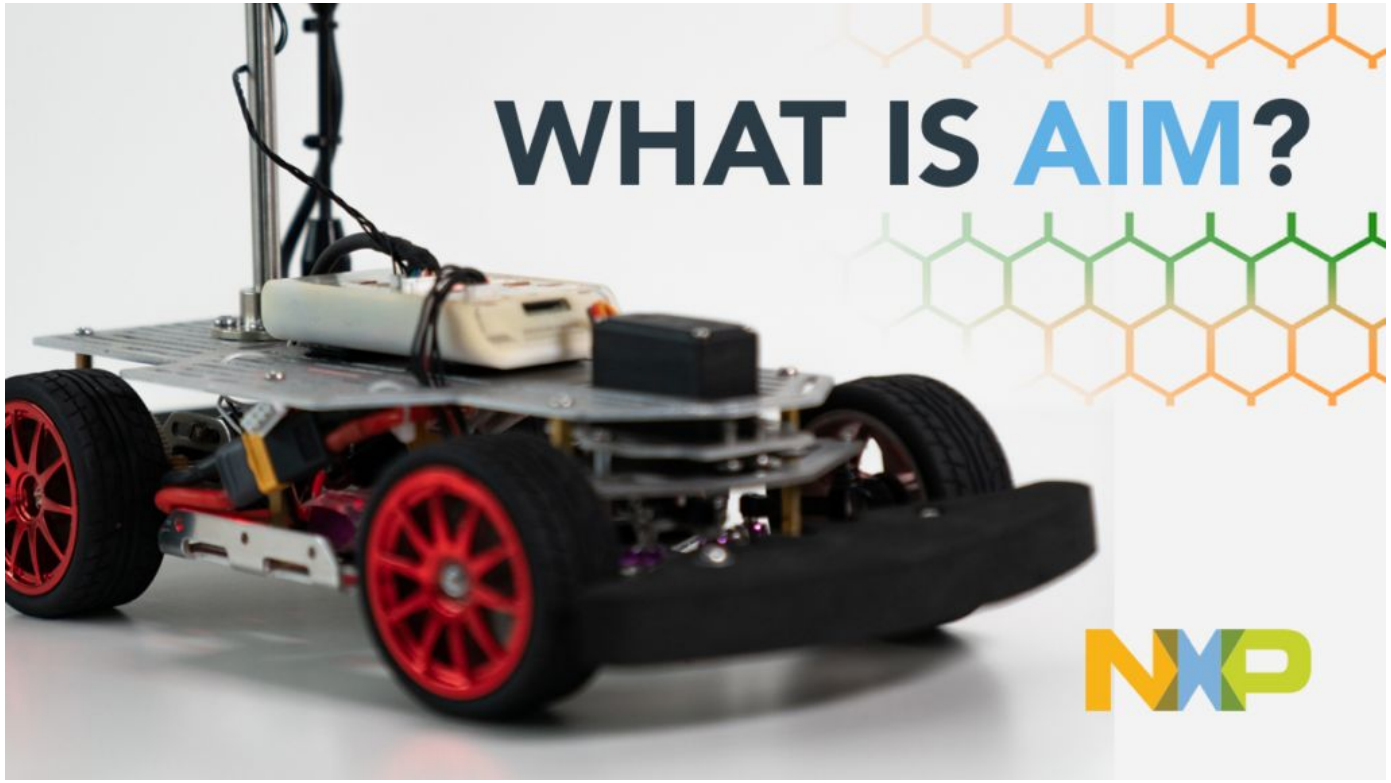
Manufacturing

- Increased use of computer vision for anomaly detection
- Process control for improved quality/reduced waste
- Predictive maintenance to maximize productivity of manufacturing equipment

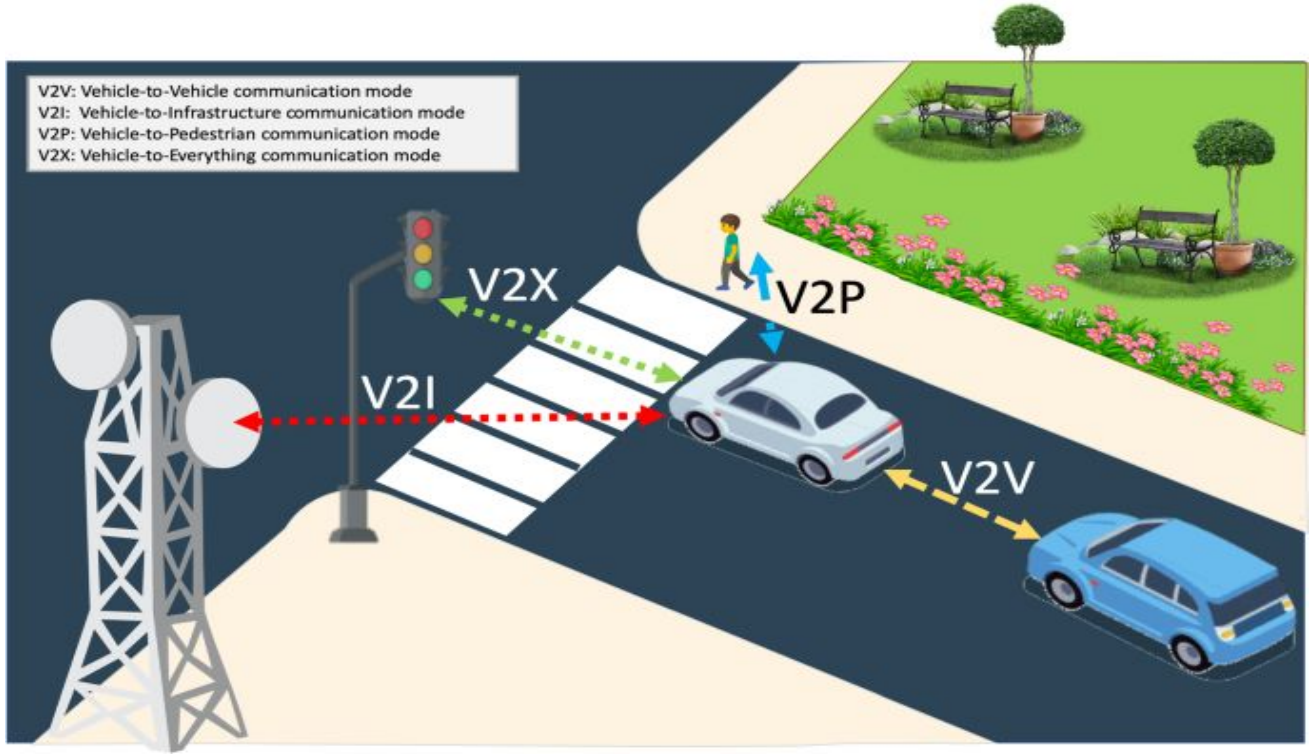
Services

- Predictive Maintenance
- Insurance

Possible Use Cases of AI & ML in NXP AIM Challenge

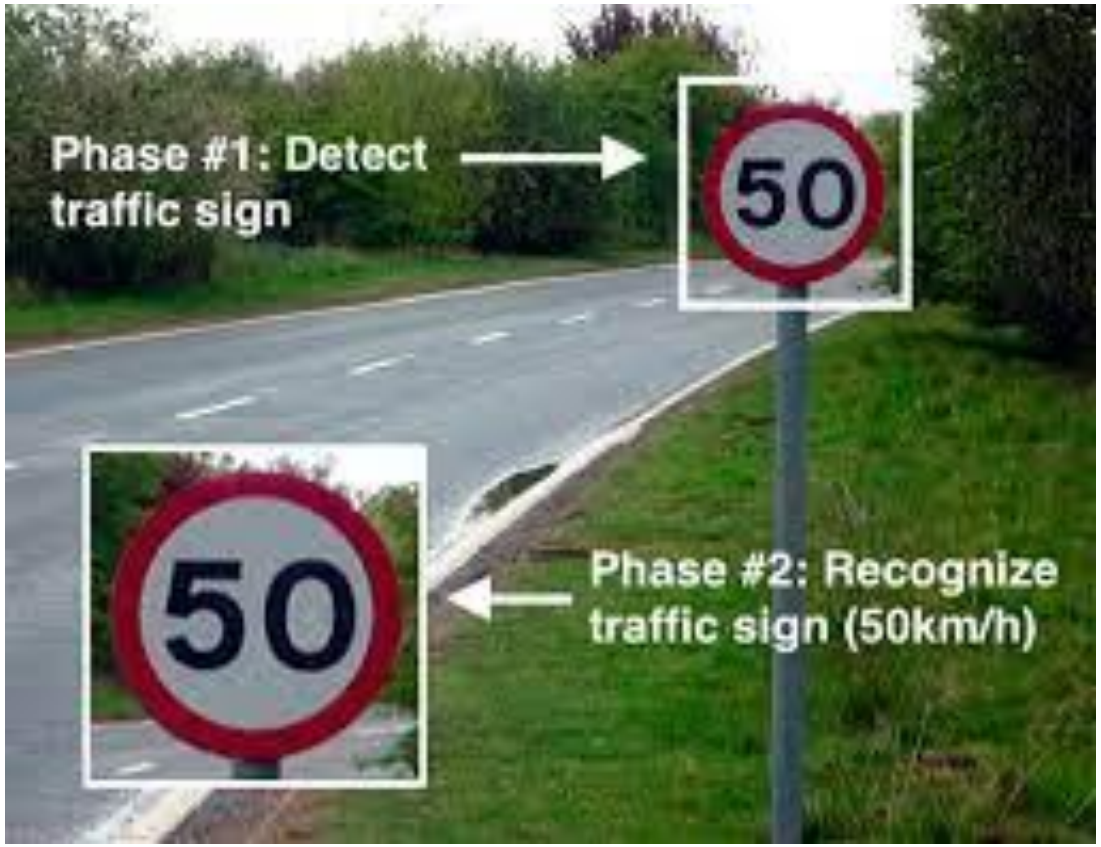


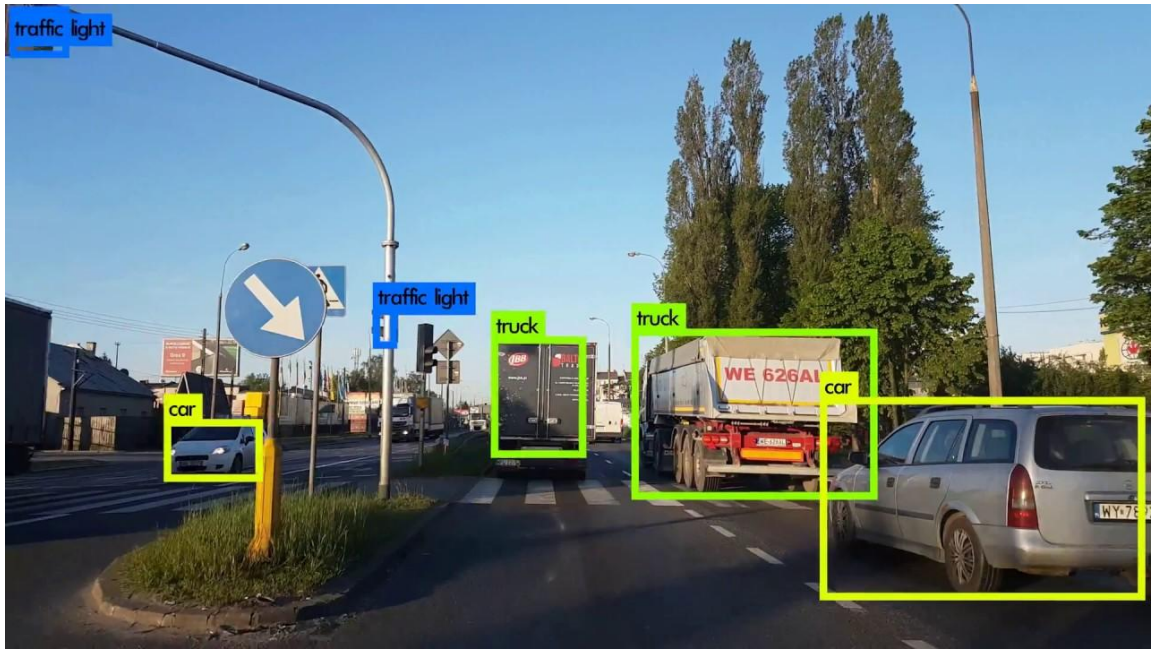
CAV : Collision Avoidance



- V2V (Vehicle to Vehicle)
- V2I (Vehicle to Infrastructure)
- V2P (Vehicle to Person)

Object / Image Recognition





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Thank you