DIFFERENCES BETWEEN CONTROLLERS

Edge AI controller

What is it?

- Combination of Edge Computing and Artificial Intelligence.
- AI algorithms are processed locally (directly on the device/on the server nearby)
- Utilizes data generated by the devices themselves and make independent decisions in milliseconds without having to connect to the Internet nor the cloud.

Advantages

- capable to work offline or with low latency or bandwidth requirements
- Delivers fast real-time feedback to enhance mission-critical applications
- Saves energy as power consumption running AI at the edge are lower than cloud data centres.

Disadvantages

- Depending on the gathered data size, utilizing public cloud data centre is likely to be less expensive and easier
- Not suitable for applications with strict security requirements in which a typical cloud computing approach with centralised servers may be less hazardous
- High cost as edge devices may require more hardware and software for optimal performance and local storage needs
- Gathered ata could be misconstrued and destroyed by an edge device by accident.

Microcontroller

What is it?

- Integrated circuit (IC) device used to control other portions of an electronic system via microprocessor unit (MPU), memory, and some peripherals
- Optimized for embedded applications that require both processing functionality and agile, responsive interaction with digital, analog or electromechanical components.

Advantages

- Easy to use, troubleshooting and system maintenance is straightforward.
- Low cost and size of the system
- Versatile and reliable

Disadvantages

- Has a complex structure.
- Number of executions is limited
- Cannot interface with high power devices directly
- The processor has a limitation on the size of data

Industrial PC

What is it?

- A robust computer designed to be used in an industrial environment
- often involved in the manufacturing of goods
- Has the following characteristics fanless and ventless design, can withstand harsh environment, highly configurable, extensive I/O options and long lifecycle

Advantages

- Efficient and reliable for industrial application
- Can withstand shocks, vibrations and particles that can destroy a system from inside

Disadvantages

- Impossible to upgrade meaning if new specifications are required, a new industrial PC will have to be purchased
- Very expensive