

Physical System Design Requirements and Recommendations in the proposed Industrial Internet of Things (IIoT) infrastructure

1) What types of physical systems you would like to see in the proposed IIoT infrastructure?

Process manufacturing systems
Discrete manufacturing systems
Others (Please specify):

2) What types of robotic systems you would like to see in the proposed IIoT infrastructure?

Stationary robotic arms
Moving robotic devices
A mix of the above two robotic systems
Others (Please specify):

Communication Networks Design Requirements and Recommendations

3) What types of wired backbone network technologies you would like to see in the proposed IIoT infrastructure?

Time-sensitive networks (TSN)
Existing Industrial Ethernet (e.g., EtherCAT, PROFINET, Modbus TCP)
Fieldbuses for manufacturing automation (e.g., MODBUS, PROFIBUS, CAN)
Fieldbuses for process automation (e.g., WorldFIP, Foundation Fieldbus, PROFIBUS-PA)
Others (Please specify):

4) What types of wireless network technologies you would like to see in the proposed IIoT infrastructure?

Satellite communications (e.g., starlink)
5G and/or LTE
Low-rate wireless personal area network (LR-WPAN) (e.g., WirelessHART, ISA100.11a, 6TiSCH, ZigBee, Bluetooth/BLE)
Industrial WLAN (e.g., WIA-FA, RT-WiFi, FlexWARE, iWLAN)
Low-power wide-area network (LPWAN) (e.g., Lora and Sigfox)
Others (Please specify):

5) What performance metrics do you care the most in your research project(s) from the networking aspect?

Data rate and bandwidth

Sampling frequencies, communication latency and jitter

Communication reliability and resilience related to various disturbances

Extendibility to future/upgraded technologies

Scalability due to the increase of the system complexity

Others (Please specify):

Data Analytics Platform Design Requirements and Recommendations

6) What types of cloud-based data analytics platform that you would like to see in the proposed IIoT infrastructure?

Microsoft Azure

Amazon AWS

Google Cloud

IBM Watson

GE Predix

Siemens MindSphere

Honeywell Sentience

Research prototype based on open-source project(s)

Others (Please specify):

7) Within the preferred data analytics platform, what specific analytics functions you would like to see?

Your response:

8) What performance metrics do you care the most in your research project(s) from the computing aspect?

Task throughput and/or latency

Required computing resources (e.g., CPU/GPU, memory)

Energy efficiency

Others (Please specify):

Interface Design Requirements and Recommendations

9) What types of messaging protocols would you like to see to serve as the interface between the real-time network infrastructure and analytics platform to support extensive data collection and streaming?

HTTP/CoAP

MQTT

XMPP

DDS

AMQP

Others (Please specify):

10) In the wired/wireless devices deployed in the proposed infrastructure, which layers of their protocol stacks would you like to have interfaces to access?

Physical layer

Data link layer

Network layer

Transport layer

Application layer

Others (Please specify):

11) In the gateway devices deployed in the proposed infrastructure, which configuration functions would you like to have interfaces to access?

Resource configuration function (e.g., number of CPU/GPU, size of memory)

Network management function

Security management function

Others (Please specify):

12) In the analytics platform in the proposed infrastructure, what interfaces would you like to see?

Your response:

Security Design Requirements and Recommendations

13) What types of security requirements you would like to see in the proposed IIoT infrastructure?

The ability to provide immutable services using distributed ledger technologies.

The ability to configure a sub-testbed within the IIoT infrastructure (e.g., in terms of device type and number of devices in the sub-testbed) for individual experiments (e.g., honeynet for data collection)

The ability to install and run software applications (once approved by the IIoT infrastructure administrator), such as machine / deep learning models to detect certain attacks (false data / command injection, low-rate denial of service attacks, malware-related, etc), in the sub-testbed within the IIoT infrastructure

The ability to train machine / deep learning models using dataset(s) generated in the IIoT infrastructure (e.g., via an API)

Others (Please specify):

Your information (Optional)

Name:

Institution:

Contact email address / number:

We appreciate your response, and please do not hesitate to contact the research team if you have further questions, suggestions or comments.

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