Synechron

Getting the 'Edge' on the Future of Computing and Artificial Intelligence

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In the cloud computing approach, data is collected from various endpoint devices and sent to centralized cloud servers where the data is stored and analyzed.

Edge Computing brings the computing resources to the endpoint devices, thereby making it possible to analyze incoming data at or near the point of data collection. Intelligent Edge is applying Artificial Intelligence (AI) technologies to edge devices to collect, analyze, and respond to data in near-real-time.

International Data Corporation predicts that there will be a whopping 55.7 billion connected devices by 2025, which will collectively generate 73.1 ZB of data.[1]

Here are two use cases where Intelligent Edge now plays a pivotal role:

Autonomous Vehicles

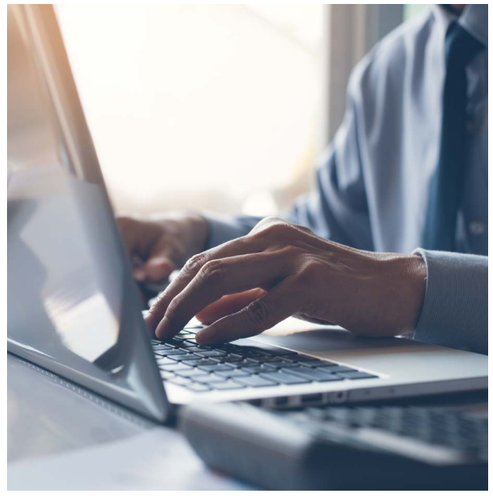
The present generation of autonomous vehicles collects environmental data – road conditions, vehicle positions, road signs, and other data – in real-time, and sends them wirelessly to cloud servers from where they receive driving instructions.

Predictive Maintenance and Improvements

Intelligent Edge can even make real-time operational optimizations a reality. Currently, operational data is analyzed centrally, and production improvements are rolled out periodically. With Intelligent Edge, manufacturers will be able to identify inefficiencies in real-time and make improvements swiftly across their production lines.

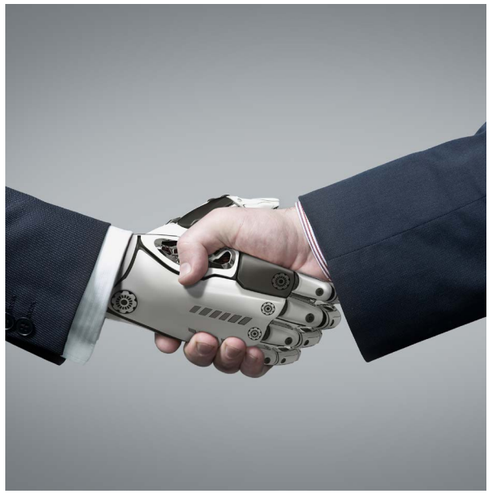
Understanding the Components of an Intelligent Edge Ecosystem

Edge Computing



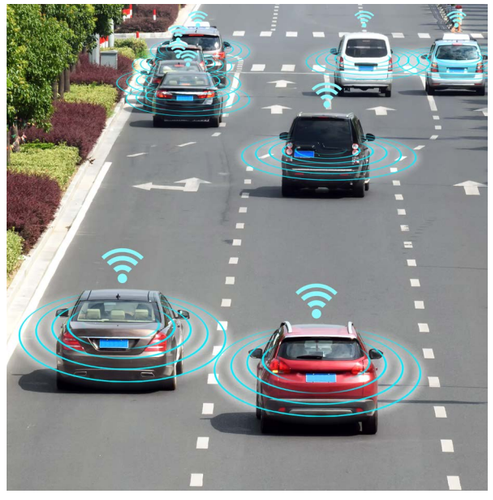
Edge computing offers several benefits like enhanced endpoint security, low latency, cost reduction on bandwidth for data transfer, and resilience of device functionality against network disruptions. The introduction of Quantum as a Service (QaaS) is the offering of quantum compute[2] facilities as an on demand service. Companies such as D-Wave, Rigetti, Microsoft and IBM offer their quantum computers for researchers, thereby allowing those who wish to experiment with quantum computing to develop code without the massive resources needed to design, build and maintain a quantum computer.

Edge AI



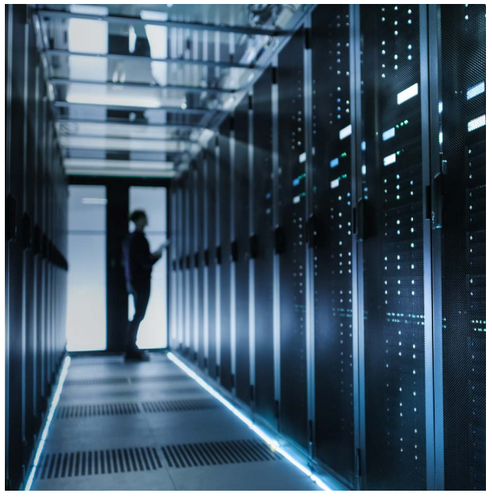
The emergence of Edge AI has turned AI development on its head. With AI being hosted on endpoint devices, the need for special-purpose chips – which are optimized for AI and their tasks – has risen. Edge AI's many benefits include real-time data processing, extreme scalability made possible by advancements in consumer-grade devices, and contextual analysis for real-time feedback.

Edge Data Management



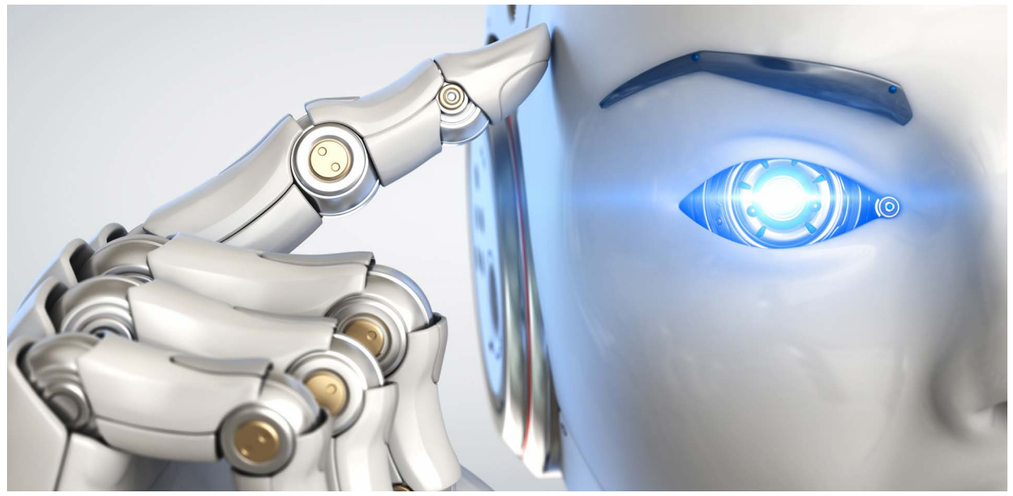
By way of example, an autonomous car generates 19 TB of data per hour. Now, multiply that by the number of autonomous cars that will ply the roads in the near future. Forget storing that data as our current infrastructure is not equipped to handle the data transfer from edge devices to the cloud, which is set to exceed the capacity of underground fiber infrastructure. Naturally, a bulk of edge data will be analyzed and stored within edge devices. At present, only 10% of data is processed in decentralized locations. According to Gartner, that will balloon to 75% by 2025.[3]

Edge Infrastructure



Edge infrastructure is more than just edge devices. It involves three critical elements: edge devices, connectivity, and a centralized data center (a cloud or in-house physical data center). If the computing happens only at the edge device, then it is local computing and not edge computing. Edge computing involves consistent, low-power connections to the core cloud or centralized in-house servers. While most of the data is analyzed at the end, some data may be processed or stored centrally.

Conclusion



Many use cases demand low-latency infrastructure, such as smart traffic management, smart grid management, AI-driven building inspections, and more. Intelligent Edge not only fulfills this demand, but also ushers in a new revolution of hardware and software development. This will inevitably be optimized to support and take advantage of Intelligent Edge.

Shubhajit is an Enterprise & Cloud Architect, and oversees the Cloud Center of Excellence (COE) team, at Synechron. As overall manager of the Synechron Cloud COE, he helps clients accelerate their cloud adoption. He is responsible for working with the executive team on cross-team, collaboration, next steps, and sponsorship. He consults with potential clients on how to design cloud adoption, migration, and cloud applications for optimal scaling. He is an innovation expert, fluent in FOG and EDGE computing, as well as Kafka and Microservices.

To learn more about how Edge Computing can optimize your financial services enterprise.

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[1]*"IoT Growth Demands Rethink of Long-Term Storage Strategies, says IDC", 27 July 2020 https://www.idc.com/getdoc.jsp?containerId=prAP46737220*
[2]*WhatIs.com https://whatis.techtarget.com/definition/quantum-computing*
[3]*"What Edge Computing Means for Infrastructure and Operations Leaders", October 3, 2018 https://www.gartner.com/smarterwithgartner/what-edge-computing-means-for-infrastructure-and-operations-leaders/*

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