Date:	09-07-2020	Name:	Jagadeesha Hegde
Course:	Introduction to Internet of Things	USN:	4AL17EC036
Topic:	Everything Can be Automated	Semester Section:	6th A-sec
GitHub repository	Jagadeesha-036		

<div align="center">AFTERNOON SESSION DETAILS</div>

Image of session

Chapter 4
Everything Can be Automated

4.1
What Can be Automated?

4.1.2
Artificial Intelligence (AI) and Machine Learning (ML)

4.1.2.2
ML in the IoT

Networking
Academy

Introducti
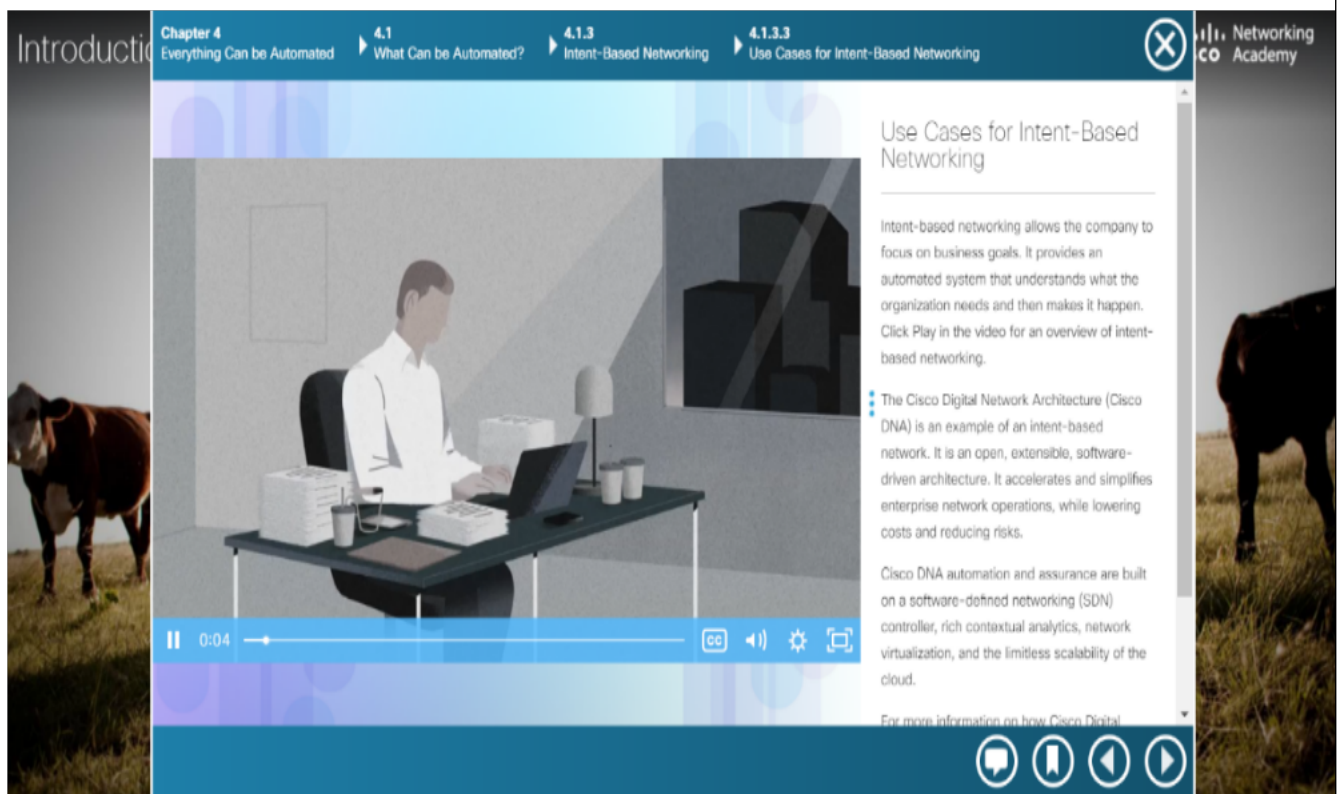
Machine Learning in the Internet of Things

ML in the IoT

One of the features of the IoT is that it enables the collection of extremely large pools of data that can "teach" programs how to respond in certain conditions. Some of the more common uses of ML technology include:

- **Speech Recognition** - Many different companies now offer digital assistants which allow you to use speech to communicate with a computer system. Apple, Microsoft, Google and Amazon all offer this service. These companies not only allow commands to be given verbally, but offer speech-to-text capabilities.

- **Product Recommendation** - Systems build up a customer profile and recommend products or services based on previous patterns. Users of Amazon and eBay receive recommendations on products. Organizations such as LinkedIn, Facebook,

Report :

What is Automation?

Automation is any process that is self-driven and reduces, then eventually eliminates, the need for human intervention.

Automation was once confined to the manufacturing industry. Highly repetitive tasks such as automobile assembly were turned over to machines and the modern assembly line was born. Machines are excellent at repeating the same task without fatigue and without the errors that humans are prone to make in such jobs. This results in greater output, because machines can work 24 hours a day without breaks. Machines also provide a more uniform product.

The IoT opens up a new world in which tasks previously requiring human intervention can become automated. As we have seen, the IoT allows the collection of vast amounts of data that can be quickly analyzed to provide information that can help guide an event or process.

As we continue to embrace the benefits of the IoT, automation becomes increasingly important. Access to huge amounts of quickly processed sensor data started people thinking about how to apply the concepts of machine learning and automation to everyday tasks. Many routine tasks are being automated to improve their accuracy and efficiency.

Automation is often tied to the field of robotics. Robots are used in dangerous conditions such as mining, firefighting, and cleaning up industrial accidents, reducing the risk to humans. They are also used in such tasks as automated assembly lines.

What Is Artificial Intelligence and Machine Learning?

Artificial Intelligence (AI) is the intelligence demonstrated by machines. This is in contrast to natural intelligence which is the intelligence displayed by living organisms. AI uses intelligent agents that can perceive their environment and make decisions that maximize the probability of obtaining a specific goal or objective. AI refers to systems that mimic cognitive functions normally associated with human minds such as learning and problem solving.

Some of the tasks that currently are deemed to require a degree of AI are autonomous cars, intelligent routing in content delivery networks, strategic game playing, and military simulations.

As technology develops, many of the tasks that at one time required AI have become routine. Many of these tasks have migrated from AI to Machine Learning (ML).

ML is a subset of AI that uses statistical techniques to give computers the ability to "learn" from their environment. This enables computers to improve on a particular task without

being specifically programmed for that task.

This is especially useful when designing and programming specific algorithms is difficult or infeasible. Examples of such tasks in computer science include malicious code detection, network intruder detection, optical character recognition, computer speech recognition, and computer vision.

One objective of learning is to be able to generalize based on experience. For machines, this involves the ability to perform accurately on new, previously unseen tasks after gaining experience with a learning data set. The training data set must come from data that is representative of the larger data pool. This data pool enables the machine to build a general model about this data, which would help it make accurate predictions.

ML in the IoT

One of the features of the IoT is that it enables the collection of extremely large pools of data that can "teach" programs how to respond in certain conditions. Some of the more common uses of ML technology include:

- Speech Recognition - Many different companies now offer digital assistants which allow you to use speech to communicate with a computer system. Apple, Microsoft, Google and Amazon all offer this service. These companies not only allow commands to be given verbally, but offer speech-to-text capabilities.

- Product Recommendation - Systems build up a customer profile and recommend products or services based on previous patterns. Users of Amazon and eBay receive recommendations on products. Organizations such as LinkedIn, Facebook, and GooglePlus recommend users you may wish to connect with.

- Shape Recognition - Programs exist that allow crude hand-drawn diagrams and notes to be converted to more formal diagrams and text. This allows the shapes and lines of hand writing to be converted to more formal text which can then be searched and analyzed.

- Credit Card Fraud Detection - A profile is constructed about the purchasing patterns of a client. Any deviation from these patterns triggers an alert and the system automatically takes action. This action ranges from denying the transaction to notifying the authorities. Some of the events that are detected and could indicate a fraudulent transaction include purchasing products not normally purchased, purchases in a different geographic area, rapidly purchasing many different products, and purchasing large-ticket items.