DEPARTMENT OF ELECTRONICS &TELECOMMUNICATION ENGG.

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Department Vision:-
To be recognized as an excellent department offering competent technical education to create competent electronics & telecommunication engineers for the benefit of the common masses.

Department Mission:-
Committed to serve the needs of society through innovative teaching learning processes, promoting industry-institute interaction to provide competent and cultured electronics and telecommunication engineers.

Program Educational Objectives:-
1. *To impart state of art technical education in the Electronics & Telecommunication Engineering.*
2. *To promote society beneficial projects and activities.*
3. *To develop soft skill, team work, professional ethics and multidisciplinary approach for the carrier enhancement.*
4. *To bridge the gap between Industry-Institute through collaboration with Industries, Institutions and Universities.*
5. *To provide suitable infrastructure and facilities in tuned with advancing technological evaluation.*

Greeting,

Department of Electronics and Telecommunication Engineering is celebrating "MVP Samaj Din" by unveiling technical newsletter "TeChronicle" VOL4, ISSUE-2 on 19th August 2022. The day is celebrated to remember all Karmaveer of M.V.P. Samaj, it is also birthday of Karmaveer Raosaheb Thorath.

Building Resilient IOT Infrastructure
[Ms. Prachi Govind Jorwar (TE E&TC)]

The Internet of things (IoT) introduces both security and epistemic challenges having to do with data ontology, network science, social science and system

Resilience in Four Acts
Kemal A. Delic Jan 2016

infrastructure in each layer. Finally, this state of the art allows us to identify the prerequisites and the insufficiencies of these solutions and to begin to analyze the potential improvements including the proposal of an architecture that implements the resilience mechanisms in four levels of the five-level IoT architecture and assures an overall resilient system.

Resilience of the system defined in this Figure includes the capability 1) to resist external perturbing events and internal failures 2) to recover smoothly and re-enter a stable state 3) to adapt its structure and behavior to constant changes. There are also concepts where a service is allowed to "degrade" e.g., deliver only a part of its functionality or displays decreased performance to prevent the denial-of-service. the loosely coupled infrastructure of the IoT ecosystem enable seamless connectivity patterns that span heterogeneous industries and networks—often using public networks and application programming interfaces (APIs)—the

ever-expanding IoT ecosystem introduces architectural, operational and security challenges.

Figure shows an improved IoT infrastructure with one more additional layer that is the processing layer, called by some researchers "Aggregation layer". It coordinates information processing, and converts the data into a standard format. Large data sets are analyzed, stored and processed. It can use servers, cloud computing and tools for large data processing. Cloud brings unique challenges and opportunities to DevSecOps practitioners to design resilient IoT infrastructure. The Cloud Application Programming Interface (API) enables automation opportunities in scale but also changes fundamental control constraints that are well engineered in physical data center. The opportunities to develop cloud agnostic security infrastructure and controls are design constraints in security engineering but as cloud evolves, the standardization will be more inevitable.
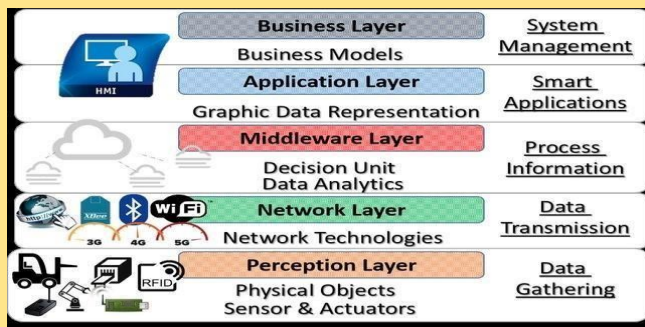
Internet of Things (IoT) has introduced enormous benefits to society over the years. With great power there must also come great responsibility to protect it. As the number of IoT devices grow and become embedded into the corporate ecosystem and so is the need to provide security for it as a top priority. The challenge is many IoT devices were not designed with security in mind. Many devices do not have an interface, lack basic security features, and simply cannot be updated or patched in the event of a software vulnerability. The global workforce continues to be digitally dispersed across the home and office devices this provides a unique challenge for security and risk leaders to overcome. This is further complicated as IoT devices move outward to partners and the larger supply chain.

IoT will help to enable an environment with the flexibility to provide services of all sorts, ranging from home automation to smart retail/logistics, and from smart environmental monitoring to smart city services. In a very short time, the IoT will have

sensing, analytics and visualization tools, which can be accessed by anyone, anytime and anywhere in the world on a personal, community or a national level. The IoT will increasingly rely on cloud computing, and smart devices with sensors built in, along with thousands of applications to support them.

In this article, a survey about the resilience techniques and approaches was made. In addition, the different IoT architectures were presented and a new five-layers IoT architecture that implements the resilience mechanisms in every layer was proposed. It implements the resilience mechanisms in all the IoT layers which ensures resilient infrastructure, communications, data processing and applications. This topic requires further research particularly as more devices and services are continuously integrated into the IoT systems.

Reference:

https://www.darkreading.com/edge-articles/how-to-build-a-resilient-iot-framework

Tesla's mission is to accelerate the world's transition to sustainable energy.
[Ms. Nupur Duse T.E.E&TC]

Tesla was founded in 2003 by a group of engineers who wanted to prove that people didn't need to compromise to drive electric – that electric vehicle can be better, quicker and more fun to drive than gasoline cars. Today, Tesla builds not only all-electric vehicles but also infinitely scalable clean energy generation and storage products. Tesla believes the faster the world stops relying on fossil fuels and moves towards a zero-emission future, the better.

Launched in 2008, the Roadster unveiled Tesla's cutting-edge battery technology and electric powertrain. From there, Tesla designed the world's first ever premium all-electric sedan from the

ground up – Model S – which has become the best car in its class in every category. Combining safety, performance, and efficiency, Model S has reset the world's expectations for the car of the 21st century with the longest range of any electric vehicle, over-the-air software updates that make it better over time, and a record 0-60 mph acceleration time of 2.28 seconds as measured by Motor Trend. In 2015, Tesla expanded its product line with Model X, the safest, quickest and most capable sport utility vehicle in history that holds 5-star safety ratings across every category from the National Highway Traffic Safety Administration. Completing CEO Elon Musk's "Secret Master Plan," in 2016, Tesla introduced Model 3, a low-priced, high-volume electric vehicle that began production in 2017. Soon after, Tesla unveiled the safest, most comfortable truck ever – Tesla Semi – which is designed to save owners at least $200,000 over a million miles based on fuel costs alone. In 2019, Tesla unveiled Model Y, a mid-size SUV, with seating for up to seven, and Cybertruck, which will have better utility than a traditional truck and more performance than a sports car.

Tesla vehicles are produced at its factory in Fremont, California, and Giga factory Shanghai. To achieve our goal of having the safest factories in the world, Tesla is taking a proactive approach to safety, requiring production employees to participate in a multi-day training program before ever setting foot on the factory floor. From there, Tesla continues to provide on-the-job training and track performance daily so that improvements can be made quickly. The result is that Tesla's safety rate continues to improve while production ramps.

To create an entire sustainable energy ecosystem, Tesla also manufactures a unique set of energy solutions, Powerwall, Powerpack and Solar Roof, enabling homeowners, businesses, and utilities to manage renewable energy generation, storage, and consumption. Supporting Tesla's automotive and energy products is Gigafactory 1 – a facility designed to significantly reduce battery cell costs. By bringing cell production in-house, Tesla manufactures batteries at the volumes required to meet production goals, while creating thousands of jobs.

And this is just the beginning. With Tesla building its most affordable car yet, Tesla continues to make products accessible and affordable to more and more people, ultimately ac celebrating the advent of clean transport and clean energy production. Electric cars, batteries, and renewable energy generation and storage already exist independently, but when combined, they become even more powerful – that's the future we want.

Reference:
https://www.tesla.com

TESLA BOT
[Ms. Minakshi Ahire, Mr. Om Chaudhari, T.E.E&TC]

Tesla Bot, also known as Optimus, is a conceptual general-purpose robotic humanoid under development by Tesla, Inc.] It was announced at the company's Artificial Intelligence (AI) Day event on August 19, 2021.CEO Elon Musk claimed during the event that Tesla would likely build a prototype by 2022. Musk is on record having said that he thinks Optimus "has the potential to be more significant than the vehicle business over time."

On April 7, 2022, a display for the product was featured at the Tesla Giga Texas manufacturing facility during the Cyber Rodeo event. Musk said that he hopes to have the robot production-ready by 2023 and claimed Optimus will eventually be able do "anything that humans don't want to do."

On June 3, 2022, Musk announced the display model at (AI) Day event and the Giga Texas opening will not look anything like the first prototype that Tesla hopes to unveil later in 2022. Tesla says it plans to build a humanoid robot to perform basic tasks, such as wrenching on cars or making grocery runs. It's part of the company's broader ambitions in automation, which include building its own computer chip, dubbed the D1, to power the networks for vehicles it hopes to one day

make self-driving.

Tesla Bot Optimus Development

Tesla previewed the robot concept at a presentation at its Fremont, Calif., factory Thursday, calling it the "Tesla Bot" and "Optimus," and said it would show a prototype in (2022). As part of the presentation, a human dressed as the machine-made robotic gestures and then danced onstage, perhaps demonstrating the range of motion that Tesla hopes the bot could achieve. Musk was quick to clarify that the dancer was not a real robot.

The company touted hardware such as its Full Self-Driving computer and computer chips, which it said could be integrated into the robot. It said the robot would also be outfitted with a screen and Tesla's Autopilot system, consisting of eight cameras.
Tesla's driver-assistance systems have come under scrutiny recently from industry rivals and federal safety investigators concerned about their rapid deployment on public roads. The National Highway Traffic Safety Administration started an investigation last week into Tesla's driver-assistance suite, known as Autopilot, following nearly a dozen crashes involving parked emergency vehicles. Musk has expressed confidence, however, that Tesla's cars will one day be able to drive themselves.

"We have almost all the pieces needed for humanoid robots, since we already make robots with wheels," Musk, acknowledging the concept was in its very early stages, said the robots would have a personality of their own.

"It's intended to be friendly, of course," he said, "and navigate through a world built for humans and eliminate dangerous, repetitive and boring tasks. He said humans need to be prepared for robots to perform menial tasks and ultimately work alongside them — if not phase them out of the workplace.
"Essentially in the future, physical work will be a

choice: If you want to do it you can, but you won't need to do it," he said.

Tesla has had a contentious relationship with its factory workforce at times, including findings that it violated labor rules in the past, and reports that it called employees back to work during coronavirus shutdowns and terminated them for not reporting to the factory line during the pandemic. The company's efforts to automate tasks have sometimes been too rapid, forcing it to backtrack and reintegrate people into the process.

Tesla's robot mock-up showed a white-clad humanoid outfitted with sensors. It would be "built by humans, for humans," according to the presentation. The robot could dead lift up to 150 pounds and travel at 5 mph.

Specifications

Tesla Bot will measure 5'8" (173 cm) tall and weigh 125 lb (57 kg). According to the presentation made during the AI Day event, a Tesla Bot will be "controlled by the same AI system Tesla is developing for the advanced driver-assistance system used in its cars" and have a carrying capacity of 45 lb (20 kg). Proposed tasks for the product are ones that are "dangerous, repetitive and boring", such as providing manufacturing assistance.

Reference:

https://en.m.wikipedia.org/wiki/Tesla_Bot

https://www.washingtonpost.com/technology/2021/08/19/tesla-ai-day-robot/

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