Cyber-Physical Systems

Humans as a species have gone a long way to reach this technological level. It started with the invention of the "industury" which is the processing of raw materials and manufacture of goods in factories as a way of survival. The Industury has seen 4 major revolutions, first mechanization and steam power was introduced, then electricity and mass production was introduced then computers were intoduced then Cyber-Physical Systems were intoduced. Our topic here is Cyber Physical Systems.

"Cyber-physical systems (CPS) refers to a new generation of systems with integrated computational and physical capabilities that can interact with humans through many new modalities." [1] They basically are a mix between the core elements of the 3 previous industrial revolutions.

The main components of a CPS include[2]**:**

1- Physical Systems: These consist of physical objects and devices like vehicles, machines, or infrastructure that interact with the environment. Sensors and actuators are commonly used to gather data and influence physical actions.
2- Computational Systems: Embedded computers and software process data collected from the physical environment. They run algorithms to analyze sensor input, optimize system performance, and generate control commands for actuators.
3- Networking Systems: Communication between the physical and computational components is facilitated by networks, such as Wi-Fi or Bluetooth. This network transmits sensor data to computational resources and control commands back to physical components, enabling real-time operations and system coordination.

Cyber Physical Systems Applications[3]**:**

- Manufacturing: CPS is used to automate the manufacturing process which saves cost of labor and material and cuts back production time.
- Healthcare: CPS is used to track a patient's health, remotely and in real-time!
- Robots: Robots are a very popular form of CPS and are used in lots of industries, they provide enhanced precision, increased productivity, and improved safety.

Challenges of Managing Cyber-Physical Systems[4]**:**

As you have seen CPS have lots of applications and potential but it is not free of cons and potential threats.
The integration of Cyber Systems to Physical ones means that it might become the target for hackers. This especially is a concern in fields like IOT(Internet of Things) which is a form of CPS but is connected to the internet. Imagine that you are driving a self driving car then a hacker hacks your car and closes the car's door and warns you that he will destroy the car if you don't give him X amount of money, this might become a reality in the near feature!

(1) Cyber-Physical Systems by R Baheti, H Gill
(2),(3) European Scientific Journal
(4) 10 Examples of Cyber-Physical Systems by The Claroty team

Challenge

According to research, teenagers spend more than 7hrs a day on average in front of their screens! Sitting in front of screens has become an integral part of life for most people these days! Computers and mobiles are escpecialy used in education and in work.

Personal challenge: Can I stay 72 hours without using my phone unless it is for studying or work?

I sadly didn't have the time to start the challenge but I have the intention of doing it. I already can block all social media apps through my router's settings or at least restricit my access to only specific time periods.

If I don't block social media apps there are multiple ways to track which apps take the most screentime. A famous app for this is the digital wellbeing app.

There are apps that completely locks your phone an example for this is the keep me out app which you can give a timer then it would lock the phone for that set amount of time. Obviously this is not recommened as you might find yourself in urgent need of your phone.

A very good book on managing one's time is "إدارة الوقت بين التراث و المعاصرة". I personally finished around 300+ pages but then got lost in the rhythm of life :(

Another Idea that I got while thinking of this challenge is perhaps I can make a mobile application myself that helps track and lock certain apps. I know a framework called flutter that helps in writing mobile applications.

I -InshAllah- intend to start this challenge very soon. Phones, computers and the internet as a whole are a serious threat to our precious time. Life is the integration of one's time, wasting your time is wasting your life.

The Prophet (ﷺ) said: "There are two blessings that many people are deceived into losing: health and **free time**." [2]

(1) [Exploding Topics: Average Screen Time for Teens (2024)](#)

(2) [Sahih al-Bukhari 6412](#)