INTRODUCTION TO FUTURE TECHNOLOGIES

How does

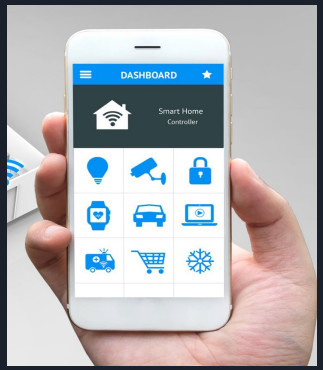
Society benefit from IOT and IIOT ?

Smart Home

Smart lighting

Smart Heating

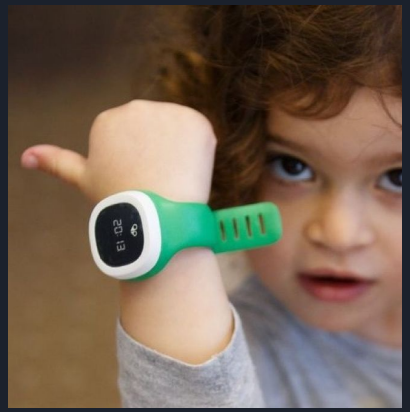
Smart Camera



Smart Control

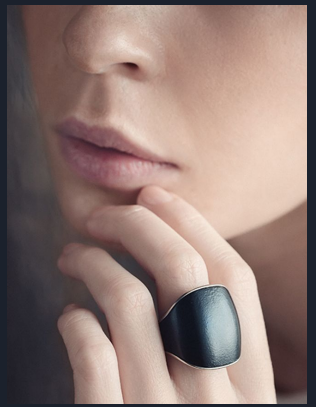
Smart Wearables

Fitness Trackers



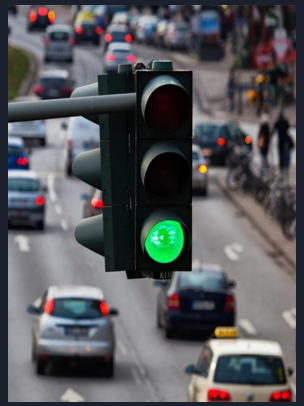
GPS Tracker

Monitoring



Panic Buttons

Smart City



Traffic Control

Smart parking

Smart tickets

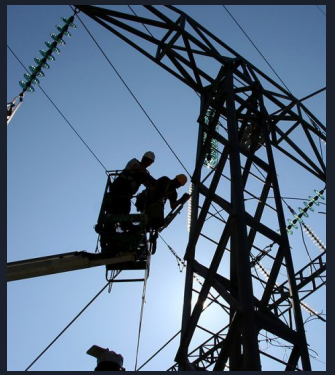
Smart meter

Smart City

Street light

Environment

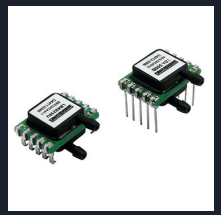
Public safety

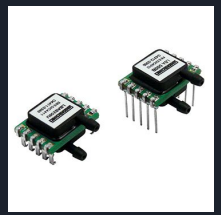


Smart grid

Smart Farming

Architecture





Sensors

Modbus

Backnet

Gateway

MQTT

MQTT Broker

logging

Database

Notify

Backend

Roadmap

Modbus :
https://www.youtube.com/watch?v=JBGaInI-TG4
https://www.youtube.com/watch?v=txi2p5_OjKU&t=335s

Backnet:
https://www.youtube.com/watch?v=oevGXrkxEos

Gateway: (C++)
https://www.youtube.com/watch?v=Rub-JsjMhWY&t=43s

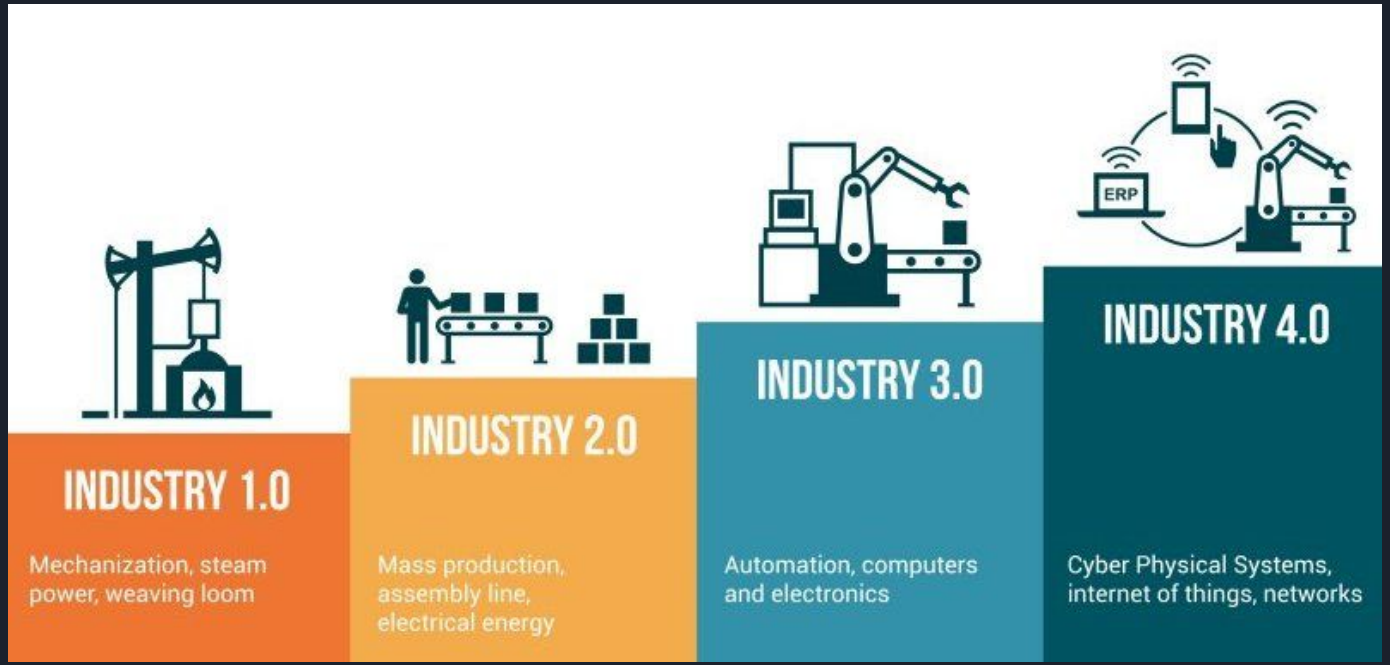
Roadmap

MQTT :
https://www.youtube.com/watch?v=EIxdz-2rhLs
http://www.steves-internet-guide.com/mosquitto_pub-sub-clients/
Paho MQTT python lib

Database logging:
Search for the client libraries to log the data

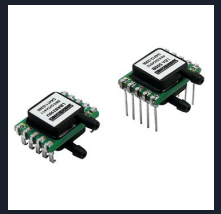
Websockets:
https://www.youtube.com/watch?v=tHbCkikFfDE&feature=youtu.be

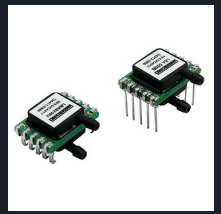
Industrial revolution



Industry 4.0

Architecture





Sensors

Protocol

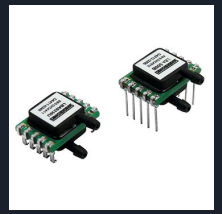
PLC

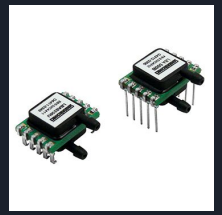
SCADA

MES

ERP

Architecture





Sensors

PLC

SCADA

MES

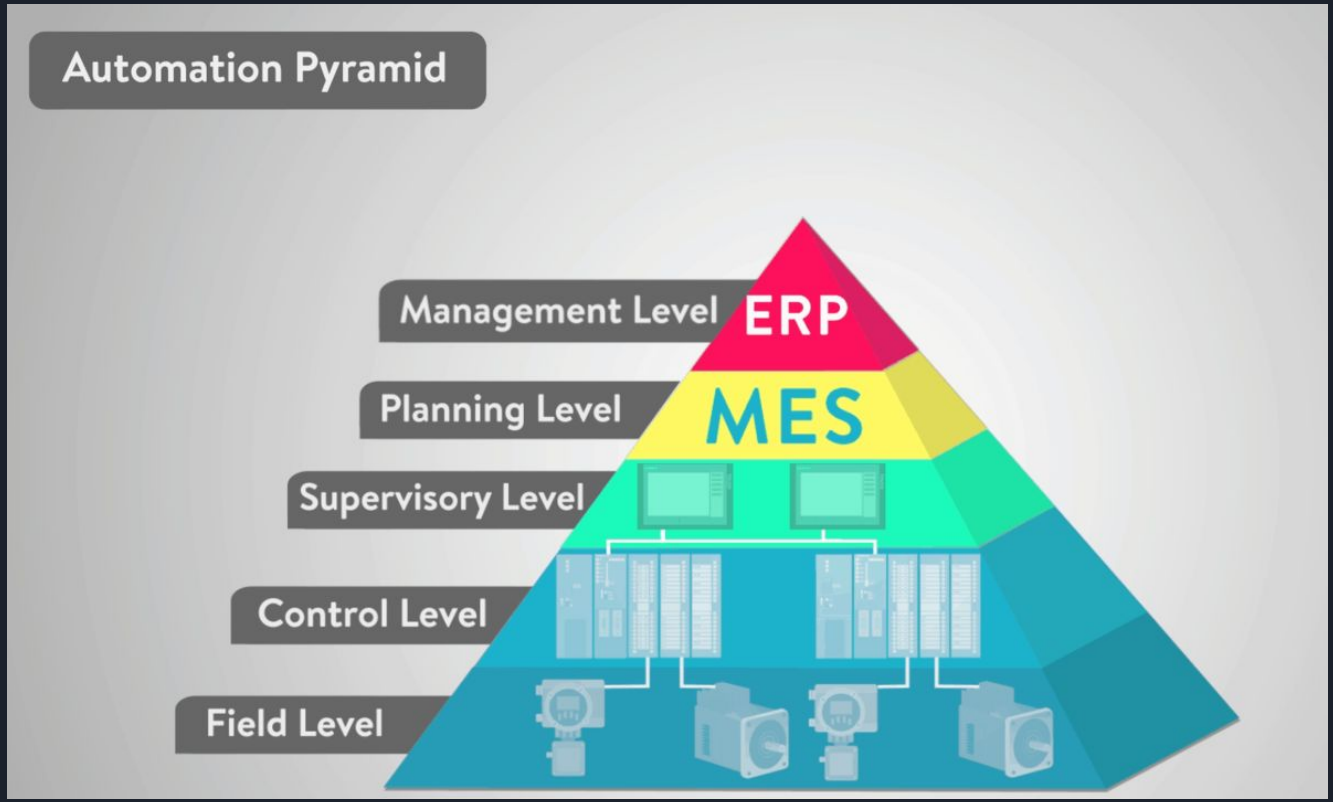
ERP

Unified namespace

Exide Project

1) Collect the data from all sensors
2) Get the data in the common pool
3) Realtime and historical data access
4) Cloud and ML


Financial Management
Customer Relationship Management
Supply Chain Management
ERP SYSTEM
Human Resource Management
Manufacturing Resource Planning


Automation Pyramid
Management Level
ERP
Planning Level
MES
Supervisory Level
Control Level
Field Level

Roadmap

IIOT:
https://www.youtube.com/watch?v=3u2cRRMIG7Q&list=PLGLQEZs6ivMq9upJo9_Jl2IRDEZFBf782

https://www.youtube.com/c/realpars/playlists

Full Stack

Connect people via social apps and sites.

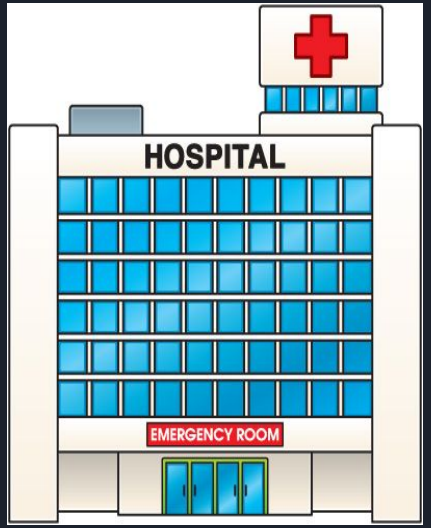
Provide entertainment in the form of *video games* and *streaming media*.

Speed post,
you are being able to track the post online

Online Ticket booking,

Movie Tickets

Travel Tickets



Appointments

Darshan Tickets

Online bill payment

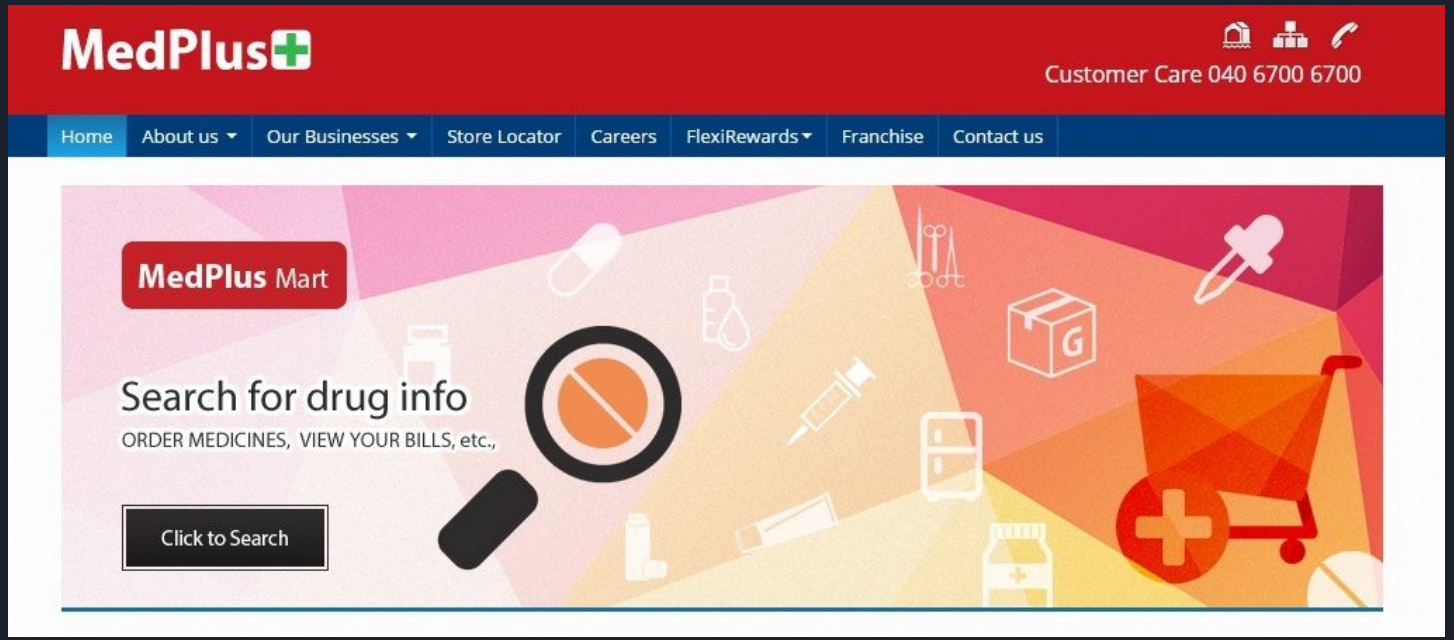
Water and electricity bill

Money transactions

Online Shopping

Buy Vegetables and groceries online

Online Shopping



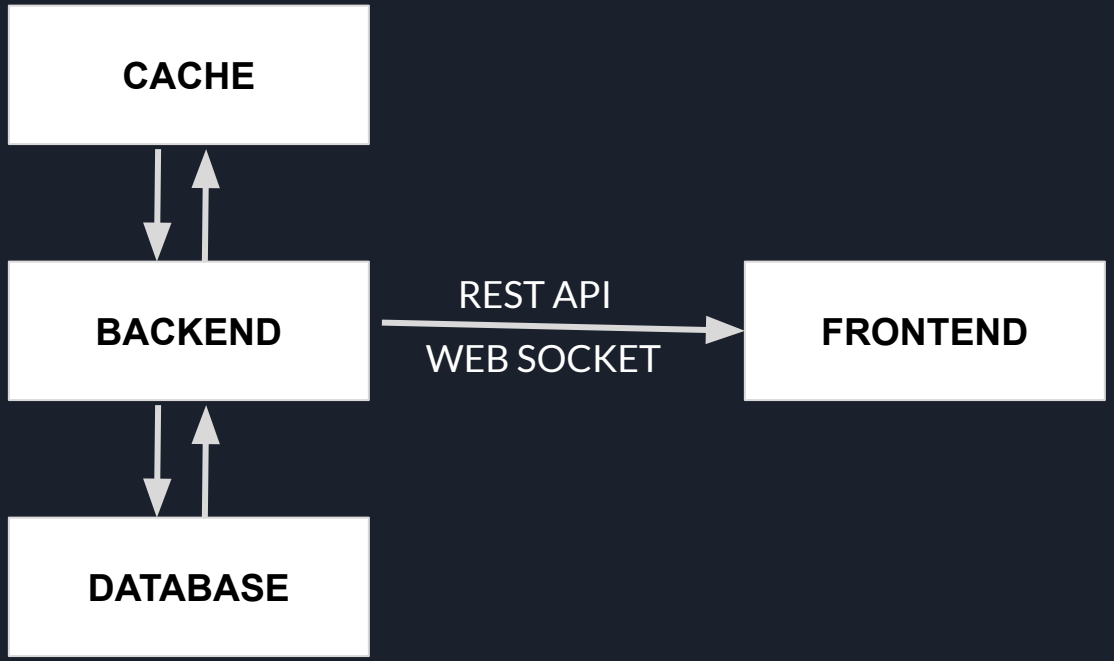
Buy medicines

Distance learning

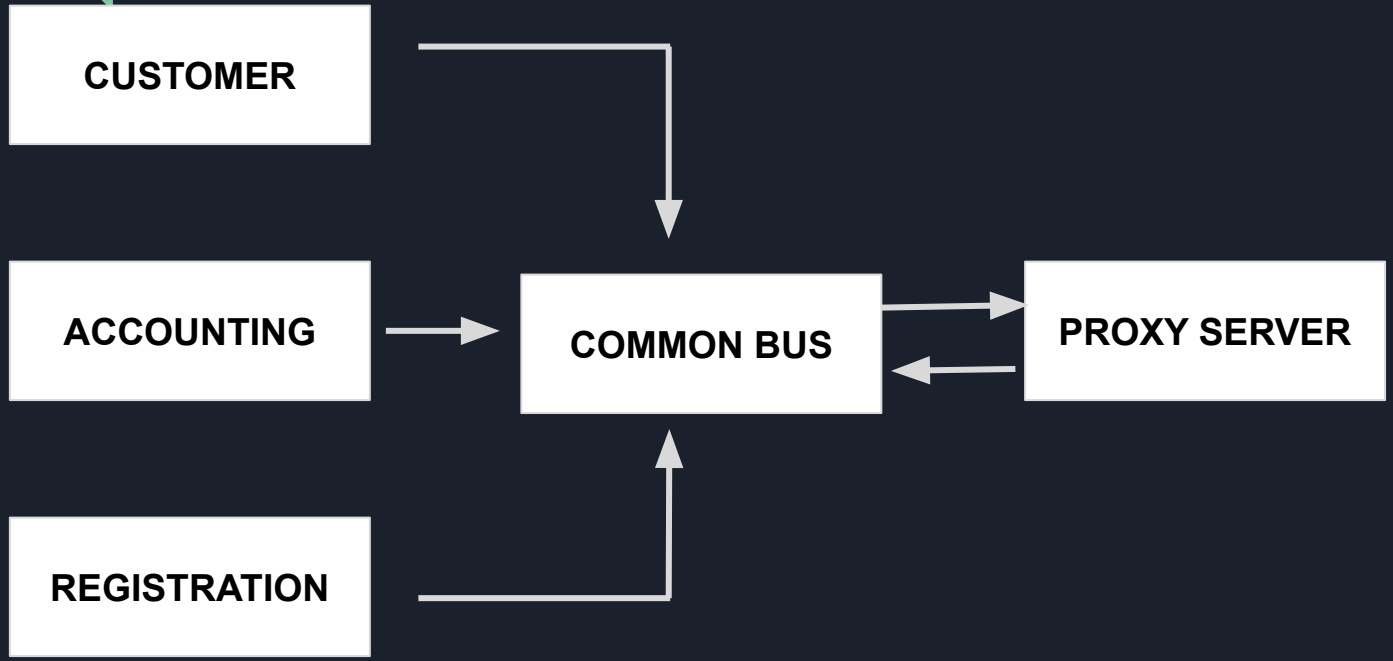
Top 10 Crowdfunding Sites For *Fundraising*

1. Kickstarter
2. Indiegogo
3. Crowdfunder
4. RocketHub
5. Crowdrise

Monolithic



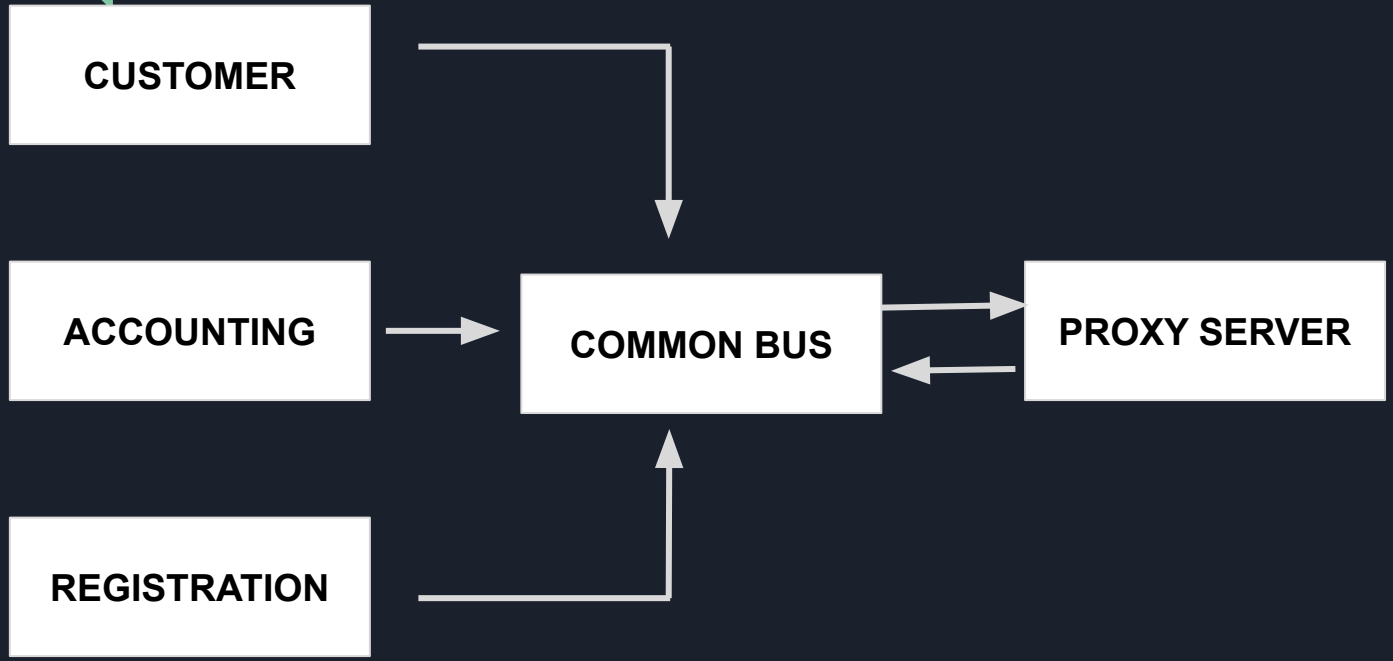
Micro services



REST API

WEB SOCKET

Micro services



REST API

WEB SOCKET

Roadmap

Architecture:
https://www.youtube.com/watch?v=V6zJi8CU7Tk&list=PLHQk72KKStzIDvpCuVrWf6gECz_hxHnSP

Frontend Roadmap

Javascript basics:
https://www.youtube.com/c/JavaBrainsChannel/playlists

DOM :
https://www.youtube.com/watch?v=zPHerhks2Vg&t=208s
https://www.youtube.com/playlist?list=PL4cUxeGkcC9gfoKa5la9dsdCNpuey2s-V

ES6:
https://www.youtube.com/playlist?list=PLwGdqUZWnOp19VX-DM4oHtmWhDfWblFh-

HTML:
https://www.youtube.com/playlist?list=PLr6-GrHUlVf_ZNmuQSXdS197Oyr1L9sPB

HTML5 and CSS3:
https://youtu.be/vQWlgd7hV4A

Frontend Basics Roadmap

JQuery:
https://www.youtube.com/watch?v=jVe1GBCqFIE&list=PL4cUxeGkcC9hNUJ0j6ccnOAcJIPoTRpO4

DOM :
https://www.youtube.com/watch?v=zPHerhks2Vg&t=208s
https://www.youtube.com/playlist?list=PL4cUxeGkcC9gfoKa5la9dsdCNpuey2s-V

ES6:
https://www.youtube.com/playlist?list=PLwGdqUZWnOp19VX-DM4oHtmWhDfWblFh-

HTML:
https://www.youtube.com/playlist?list=PLr6-GrHUlVf_ZNmuQSXdS197Oyr1L9sPB

HTML5 and CSS3:
https://youtu.be/vQWlgd7hV4A

Backend Basics Roadmap

Nodejs basics:
https://www.youtube.com/watch?v=hQd4TCGB_nE
https://www.youtube.com/playlist?list=PL4cUxeGkcC9gcy9lrvMJ75z9maRw4byYp
https://www.youtube.com/watch?v=TlB_eWDSMt4&feature=youtu.be

Nodejs REST API :
https://www.youtube.com/watch?v=Q-BpqyOT3a8&feature=youtu.be
https://www.youtube.com/watch?v=pKd0Rpw7O48

JSON:
https://youtu.be/wI1CWzNtE-M

AJAX:
https://youtu.be/rJesac0_Ftw

Fullstack project:
https://www.youtube.com/playlist?list=PLillGF-RfqbaEmlPcX5e_ejaK7Y5MydkW

Backend Basics Roadmap

Practice :
https://www.youtube.com/watch?v=0JNq46eFuOM&feature=youtu.be

ASYNC AWAIT:
https://www.youtube.com/watch?v=yTh6q-k2bEA&feature=youtu.be

Advanced JS:
https://www.youtube.com/playlist?list=PLqrUy7kON1meuCvGp2D6yTglZhPTT_s_f

this pointer:
https://youtu.be/zE9iro4r918

Database Roadmap

Everything:
https://awesomedataengineering.com/

Postgres database:
https://youtu.be/Dd2ej-QKrWY

React Js Roadmap

React Js:
https://www.youtube.com/watch?v=yZ0f1Apb5CU&list=PL4cUxeGkcC9i0_2FF-WhtRIfIJ1IXlTZR
https://www.youtube.com/playlist?list=PL4cUxeGkcC9ij8CfkAY2RAGb-tmkNwQHG
https://www.youtube.com/watch?v=fSp2C7QPH8M

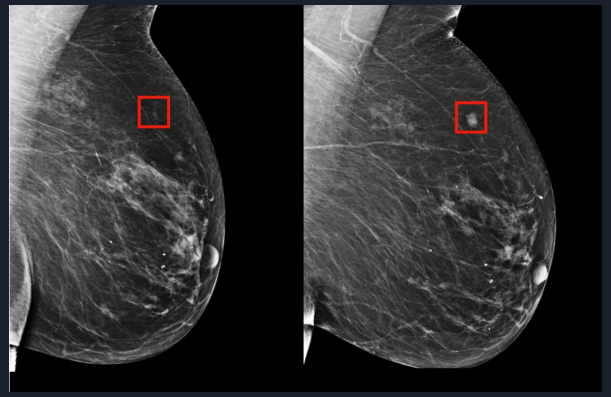
Redux:
https://youtu.be/poQXNp9ItL4

Material UI:
https://material-ui.com/getting-started/learn/

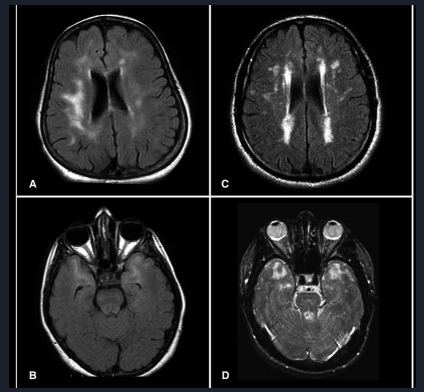
Github:
https://youtu.be/xuB1Id2Wxak

Data science

Identifying *Diseases* and *Diagnosis* during the initial stages



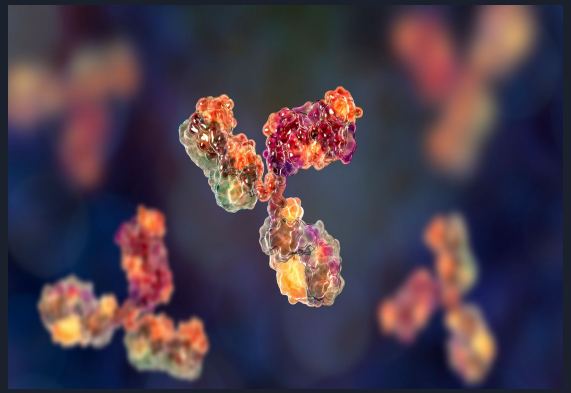
Breast Cancer



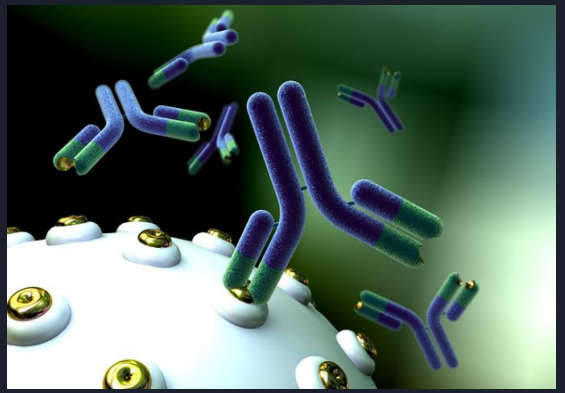
Brain tumors

Bone fractures

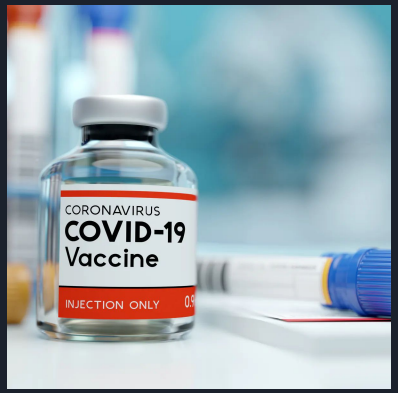
Drug Discovery and Manufacturing



Antibody drug discovery



Combination of drugs



Design vaccine

Smart Health Records And Personalized Medicine

ML -based Behavioral Modification

Helps you to understand your *unconscious bad* behavior and make necessary changes

AI based Clinical Trial and Research

Usage in ensuring *real-time monitoring* and data access of the trial participants,
finding the best sample size to be tested.

AI based Outbreak Prediction

Predicting outbreaks is helpful in third-world countries as they lack in medical infrastructure.

Smart Farming and *Selective* Breeding

Breeding for the *desired features* in crops is a very resource-intensive and time-consuming process, which however drives much value in commercial agriculture.

Agrochemical Production

Pesticides, antibiotics, and insecticides

ML can make the chemicals much less hazardous and more environment friendly.

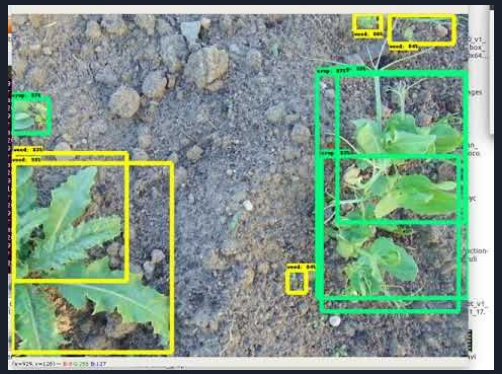
Soil Analysis and *Disease* Detection

Moisture, temperature, and nitrogen levels play an important role in crop wellbeing.

Traditionally, farmers spread equal amounts of pesticides per square meter.

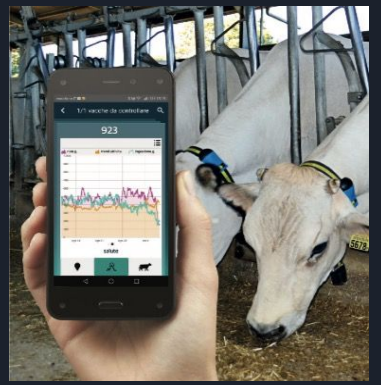
Analyze the soil erosion levels and health conditions, plant diseases and nutrient deficiencies of individual crops.

Treatment customization can have a tremendous environmental impact globally



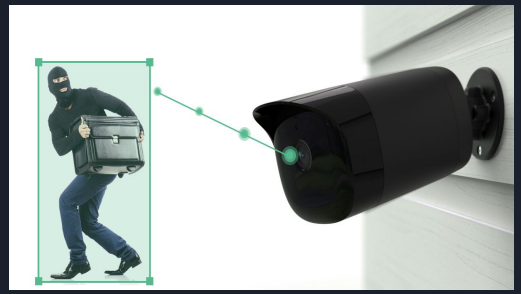
Weed Detection

Water Analysis



Livestock Health Control

AI for Crime Prevention



AI Security Cameras for Number plate and face detection during hit and run accidents.

On suspicion Alert and Alarm concerned authority.

Detect micro expressions among pedestrians, anticipating criminal behavior

Roadmap

Probability:
https://seeing-theory.brown.edu/

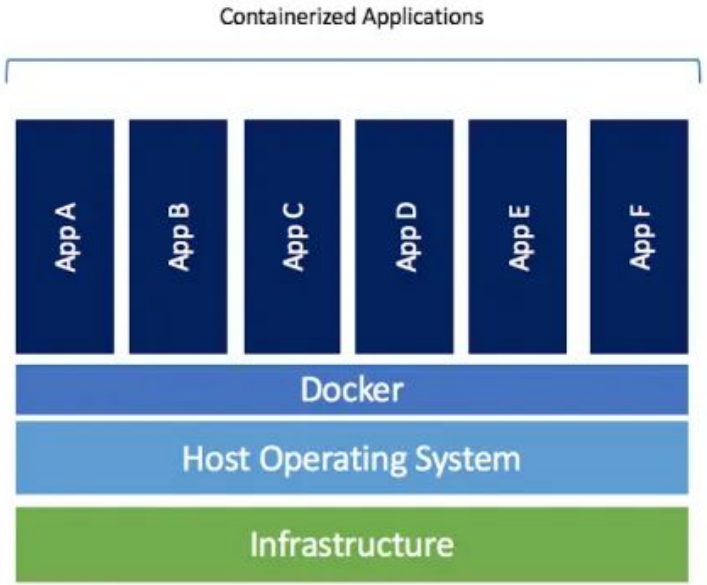
Math:
https://www.geekwire.com/2020/steve-brunton/
https://www.youtube.com/channel/UCYO_jab_esuFRV4b17AJtAw
https://www.youtube.com/channel/UCpCSAcbqs-sjEVfk_hMfY9w

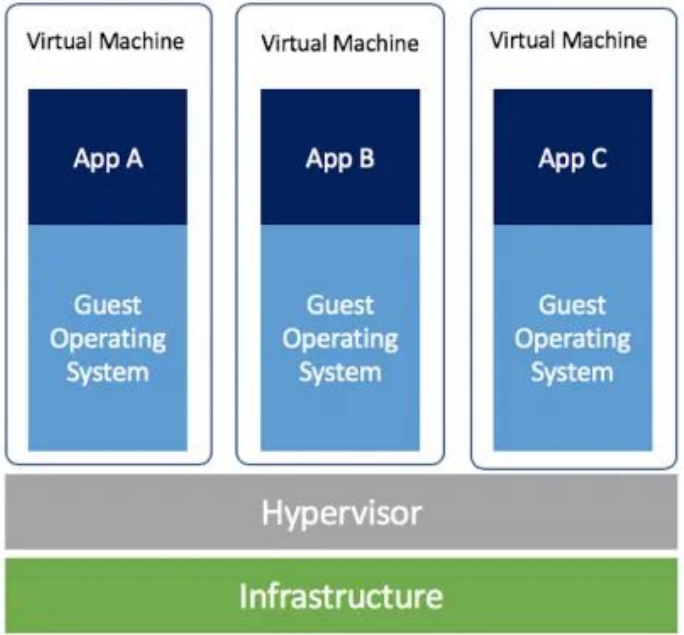
ML:
https://whimsical.com/machine-learning-roadmap-2020-CA7f3ykvXpnJ9Az32vYXva
https://www.youtube.com/watch?v=pHiMN_gy9mk&t=5858s

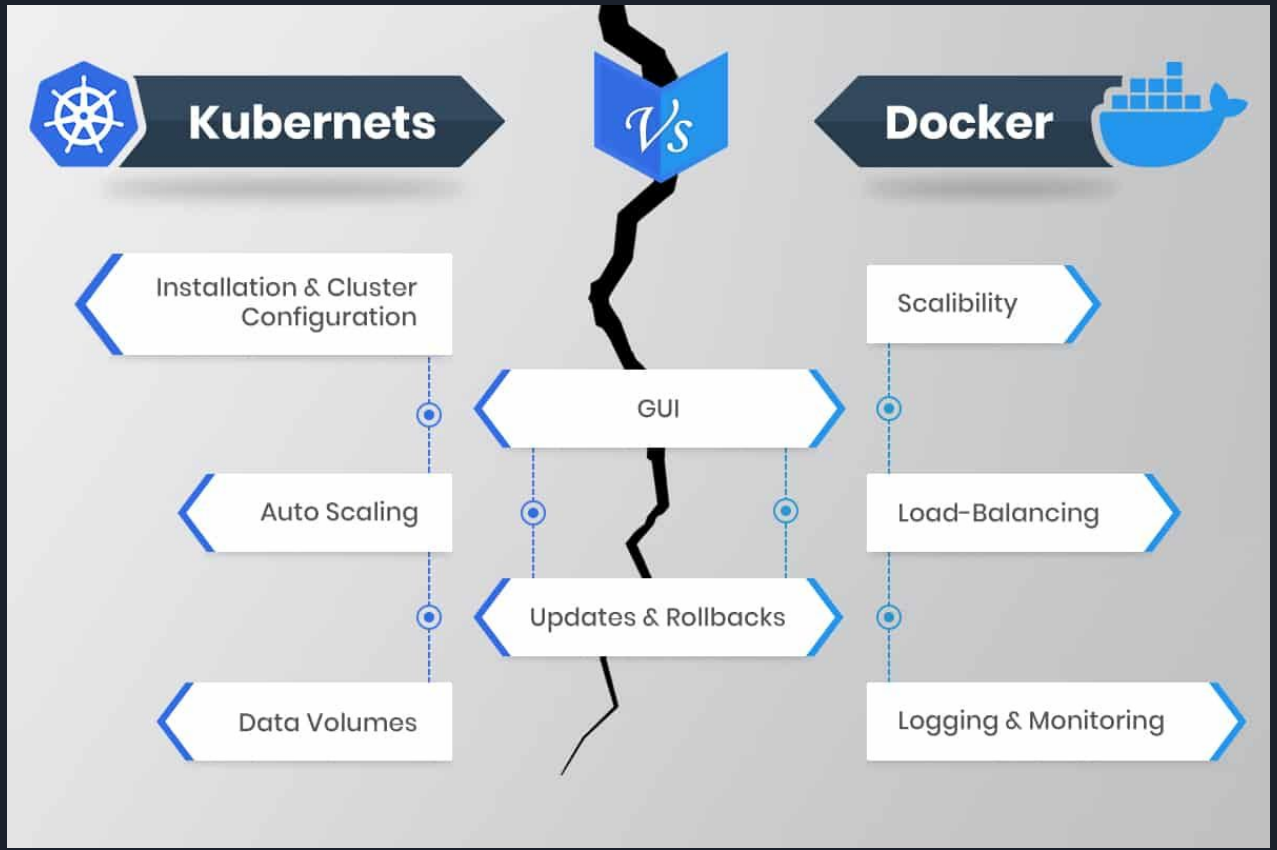
Python:
https://tenthousandmeters.com/blog/python-behind-the-scenes-1-how-the-cpython-vm-works/
https://calmcode.io/
https://blog.finxter.com/python-one-line-for-loop-a-simple-tutorial/

Github:
https://github.com/PacktPublishing/

Devops


Containerized Applications
App A
App B
App C
App D
App E
App F
Docker
Host Operating System
Infrastructure


Virtual Machine
App A
Guest Operating System
Virtual Machine
App B
Guest Operating System
Virtual Machine
App C
Guest Operating System
Hypervisor
Infrastructure


Kubernets
Vs
Docker
Installation & Cluster Configuration
Auto Scaling
Data Volumes
GUI
Updates & Rollbacks
Scalibility
Load-Balancing
Logging & Monitoring

Roadmap

Docker and kubernetes:
https://www.youtube.com/watch?v=3c-iBn73dDE
https://www.youtube.com/watch?v=X48VuDVv0do&t=8078s

IT:
https://www.youtube.com/watch?v=awLnur5Yt9o

Mobile application

Roadmap

React Native:
https://www.youtube.com/playlist?list=PLhQjrBD2T382gdfveyad09Ierl_3Jh_wR

Block Chain

Roadmap

Resource:
https://www.technologyreview.com/topic/blockchain/

https://www.google.com/url?sa=t&source=web&rct=j&url=https://ocw.mit.edu/courses/sloan-school-of-management/15-s12-blockchain-and-money-fall-2018/video-lectures/session-1-introduction/&ved=2ahUKEwjz0cnkp6TtAhVlMewKHfGFB0QQwqsBMAB6BAgnEAM&usg=AOvVaw3K_EGaTOeg6LXazMpCpotF

Cybersecurity

Roadmap

Resource:
https://www.youtube.com/watch?v=PlHnamdwGmw
https://www.youtube.com/watch?v=Snrh580U3tI&t=81s
https://blog.avast.com/a-cybersecurity-primer

Thank you