

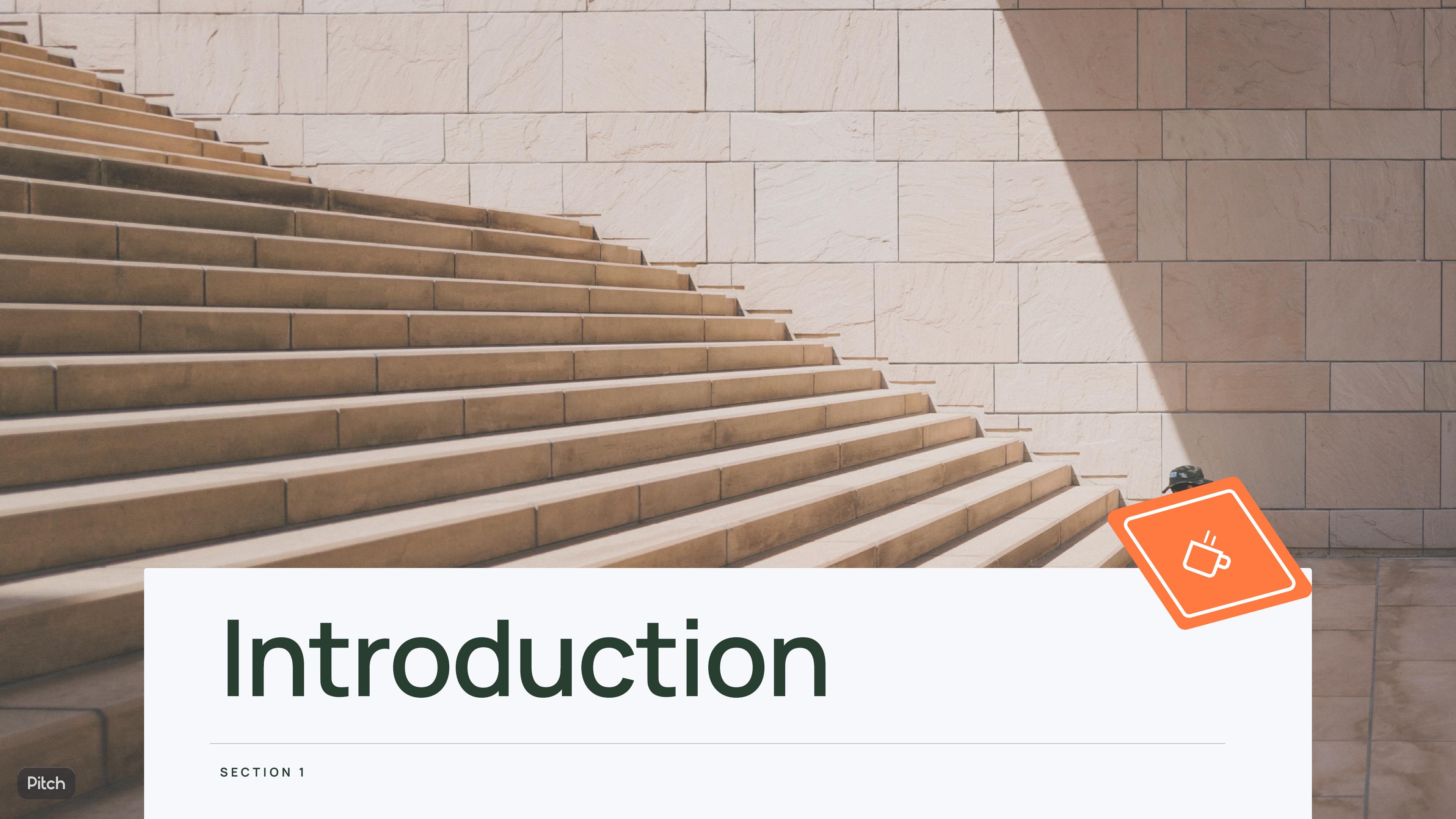


Webinar Presentation

Telepresence Robot

MCTE 4324: REAL-TIME SYSTEMS

PRESENTED BY: AHMAD FAAIZ



Introduction

SECTION 1



Overview



Kulliyyah of Engineering(KoE) and Mechatronics Department

Introduction on Real-Time Systems

Real-Time System Application on Telepresence Robot



KoE & MCT

SECTION 2



Kulliyyah of Engineering, IIUM

9 PROGRAMMES

1. **Civil** Engineering
2. **Communications** Engineering
3. **Electronics - Computer and Information**
4. **Automotive** Engineering
5. **Aerospace** Engineering
6. **Materials** Engineering
7. **Manufacturing** Engineering
8. **Biochemical-Biotechnology** Engineering
9. **Mechatronics** Engineering

MORE INFO:

- WWW.IIUM.EDU.MY/KULLIYYAH/KOE (OFFICIAL IIUM LINK)
- [ENGINEERING COURSES & STAFF DIRECTORIES](#) (UNOFFICIAL DATABASE)
- [CENTRE OF UNMANNED TECHNOLOGIES](#) (RESEARCH CENTRE)

6 DEPARTMENTS

1. Civil
2. Electrical and Computer
3. Mechanical
4. Manufacturing and Materials
5. Biotechnology
6. Mechatronics

#7 including Department of Science

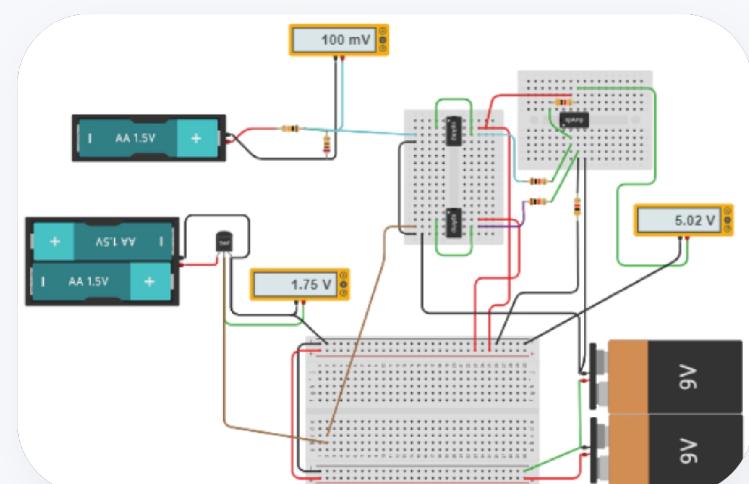


Mechatronics (MCT)

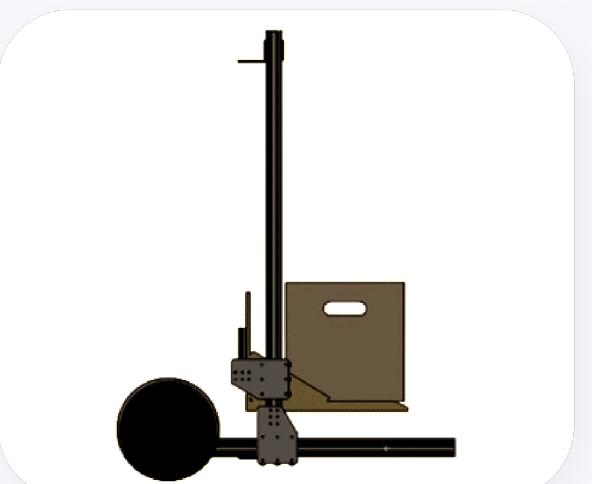
<https://engine.iium.edu.my/mechatronics> (Department of MCT Website)

The **Mechatronics Engineering Department** provides an integrated education encompassing

- Electrical
- Mechanical
- Control and computer engineering disciplines



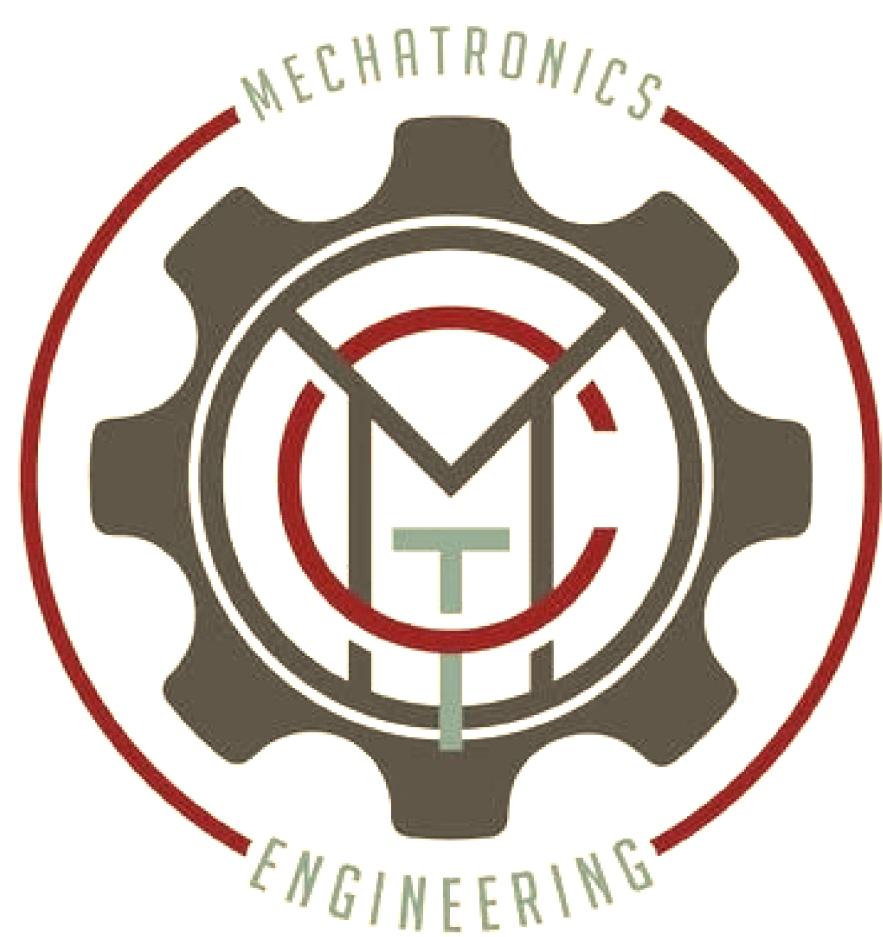
TINKERCAD SIMULATIONS



IDP DRAFT DESIGN



CONTROL & PROGRAMMING
SOFTWARES





Real-Time Systems

SECTION 3

Links:

Introduction to
Real-Time Systems

1) www.geeksforgeeks.org/real-time-systems

A good brief of introduction to what real-time system is and a few terms related to real-time system are also explained here. More articles about the topic of real-time systems can be discovered through this website.

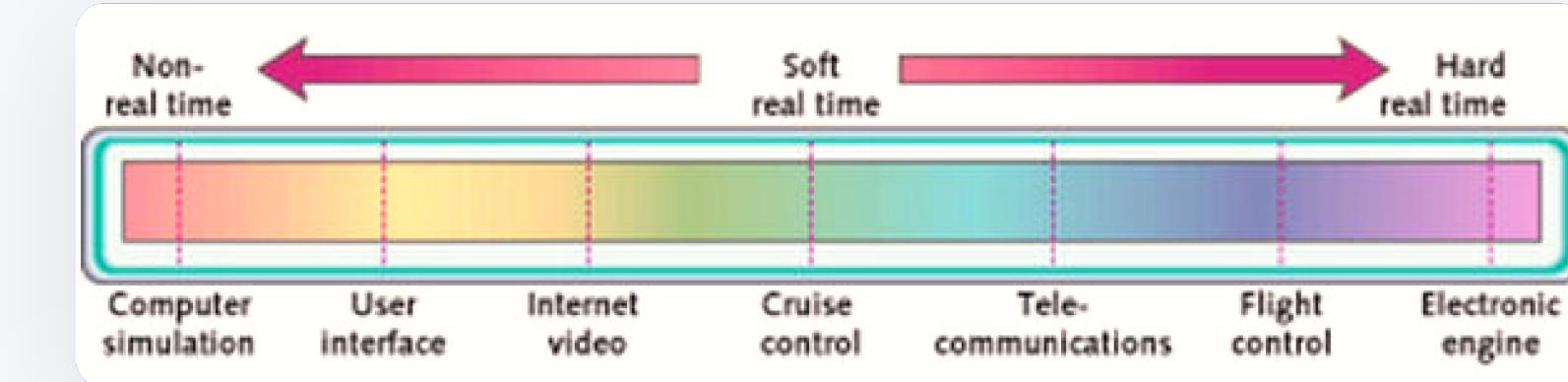
2) www.cse.unsw.edu.au/~cs9242/08/lectures/09-realtimex2.pdf

Explanation of real-time systems via numerous slides presentation. Talks about the definition of Real-Time Systems (RTS), Scheduling in RTS, Schedulability analysis, Worst Case Execution Time Analysis, Time and Distributed RTS and Rate Based Scheduling.

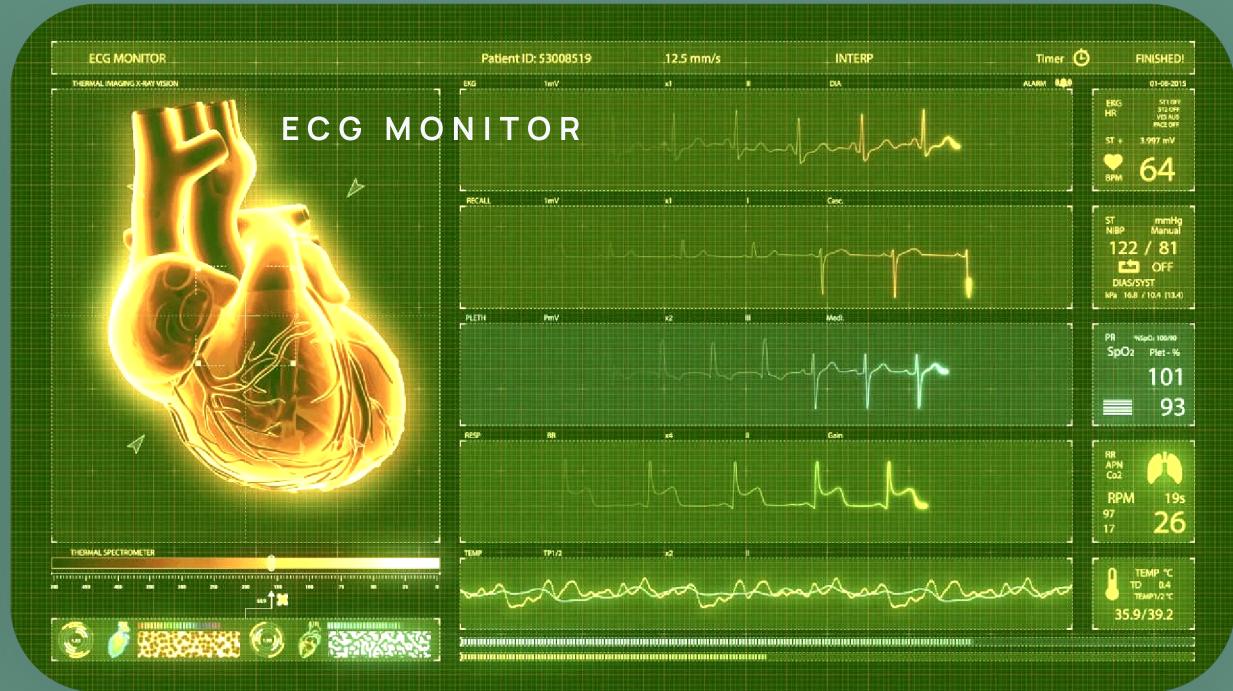


3) <https://youtu.be/F321087yYy4>

Video explanation of what is Real-Time Operating System (RTOS) and what it does.



Examples of Real-Time Systems



Terms and RTOS Concepts

Job/Instruction

A small piece of work that can be assigned to a processor and may or may not require resources

Task

It is a group of instructions performing a function a system that solves a portion of problems.

Deadline

A task is expected to perform its function by the time allocated to it.

Process

An instance of a computer program.

Thread

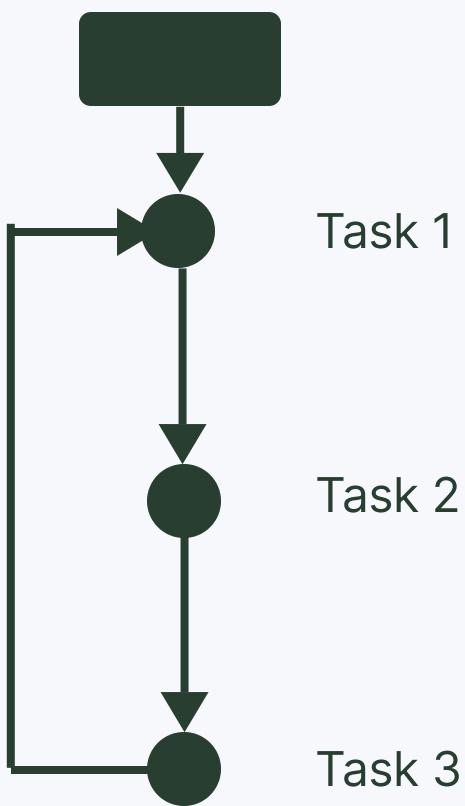
A path of execution within a process. A process can contain multiple threads.

Scheduling
Prioritization
Memory Management
Time slicing

Timers
Inter-task Communication
Interrupt
Context switch

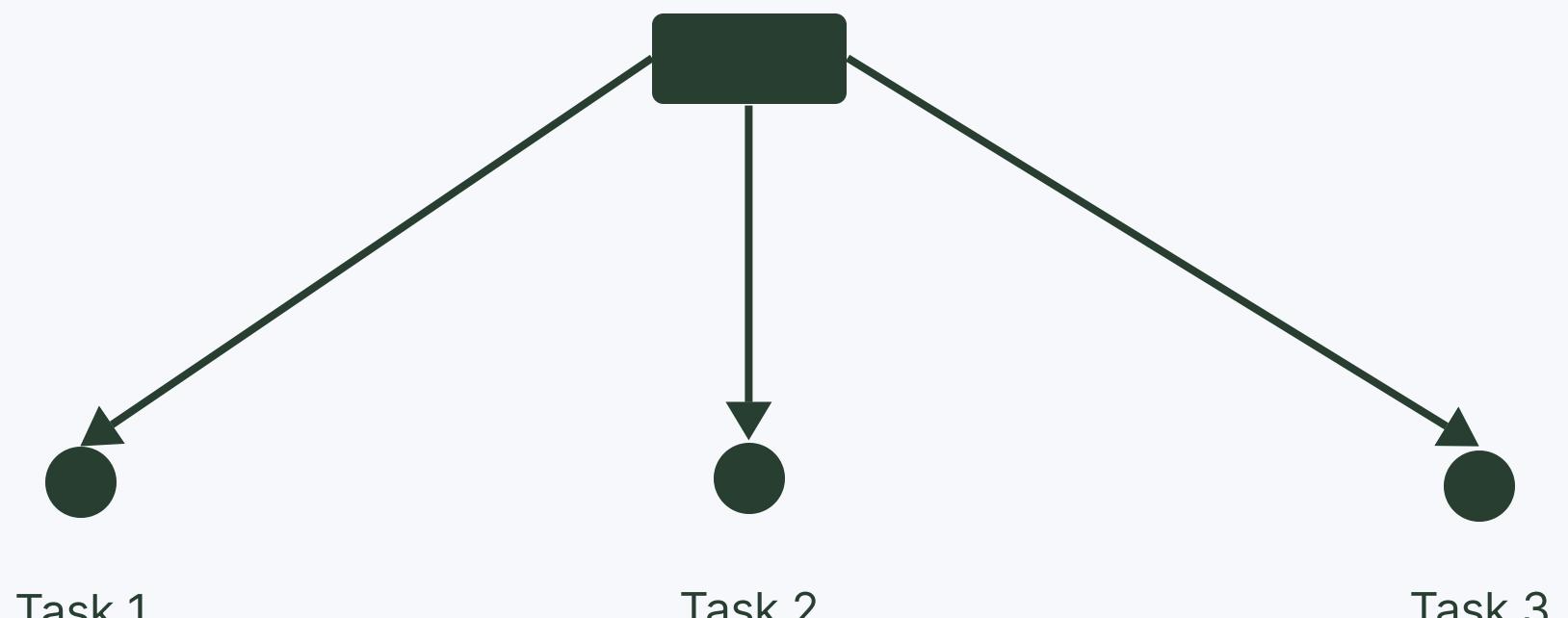
Multitasking

Super Loop



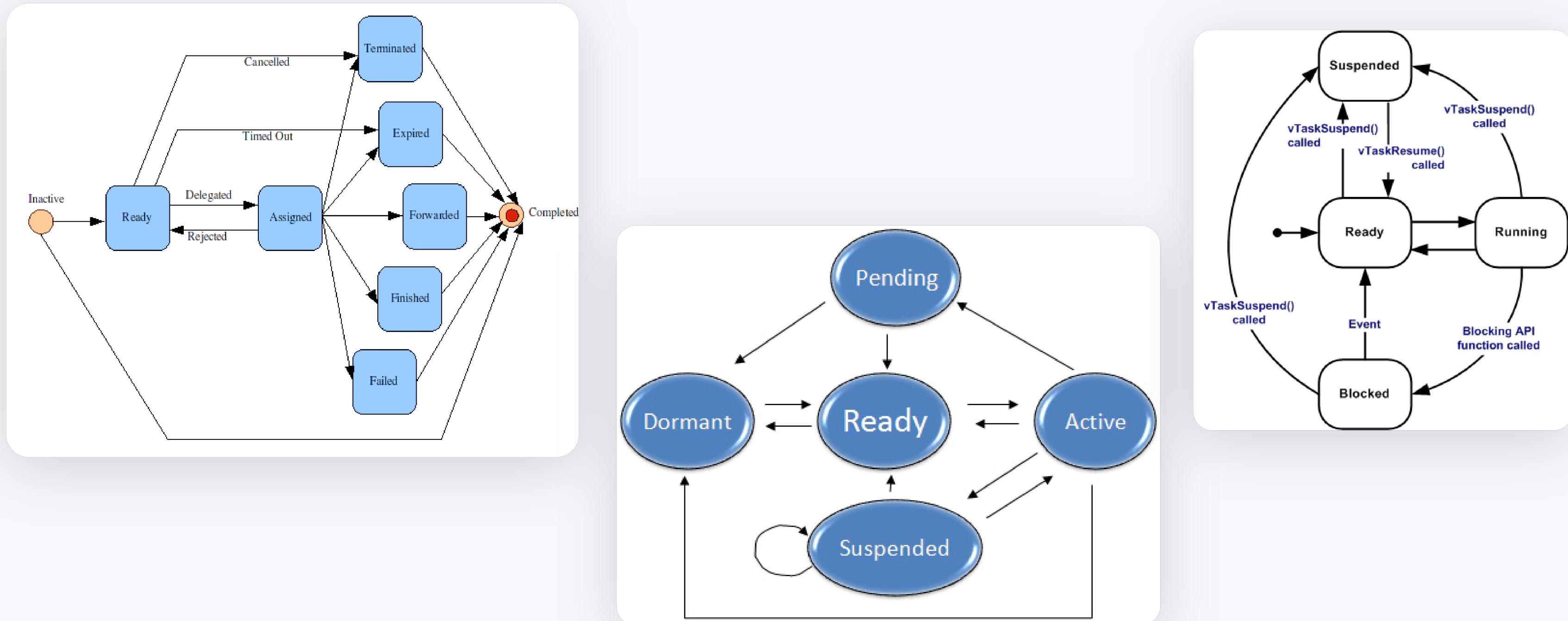
One thread, performing tasks, one by one

RTOS



RTOS are capable of handling tasks concurrently

Task States





Telepresence Robot

SECTION 4

What is a Telepresence Robot?

[HTTPS://ROBOTS.NET/TECH-REVIEWS/WHAT-ARE-TELEPRESENCE-ROBOTS-AND-HOW-THEY-BENEFIT-US/](https://robots.net/tech-reviews/what-are-telepresence-robots-and-how-they-benefit-us/)

A wheeled "Skype" machine.

[HTTPS://TELEPRESENCEROBOTS.COM/WHAT-TELEPRESENCE-ROBOT-AND-WHAT-CAN-THEY-DO](https://telepresencerobots.com/what-telepresence-robot-and-what-can-they-do)

A computer, tablet, or smartphone-controlled robot which includes a video-camera, screen, speakers and microphones so that people interacting with the robot can view and hear its operator and the operator can simultaneously view what the robot is “looking” at and “hearing.”

A telepresence robot helps place “you” at a remote location instantly, providing you a virtual presence, or “telepresence.”



VARIOUS TELEPRESENCE ROBOTS:

[HTTPS://WWW.ZDNET.COM/ARTICLE/BEST-TELEPRESENCE-ROBOT/](https://www.zdnet.com/article/best-telepresence-robot/)

TELEPRESENCE ROBOT FROM
DOUBLE ROBOTICS

Example of initiating a Telepresence Robot

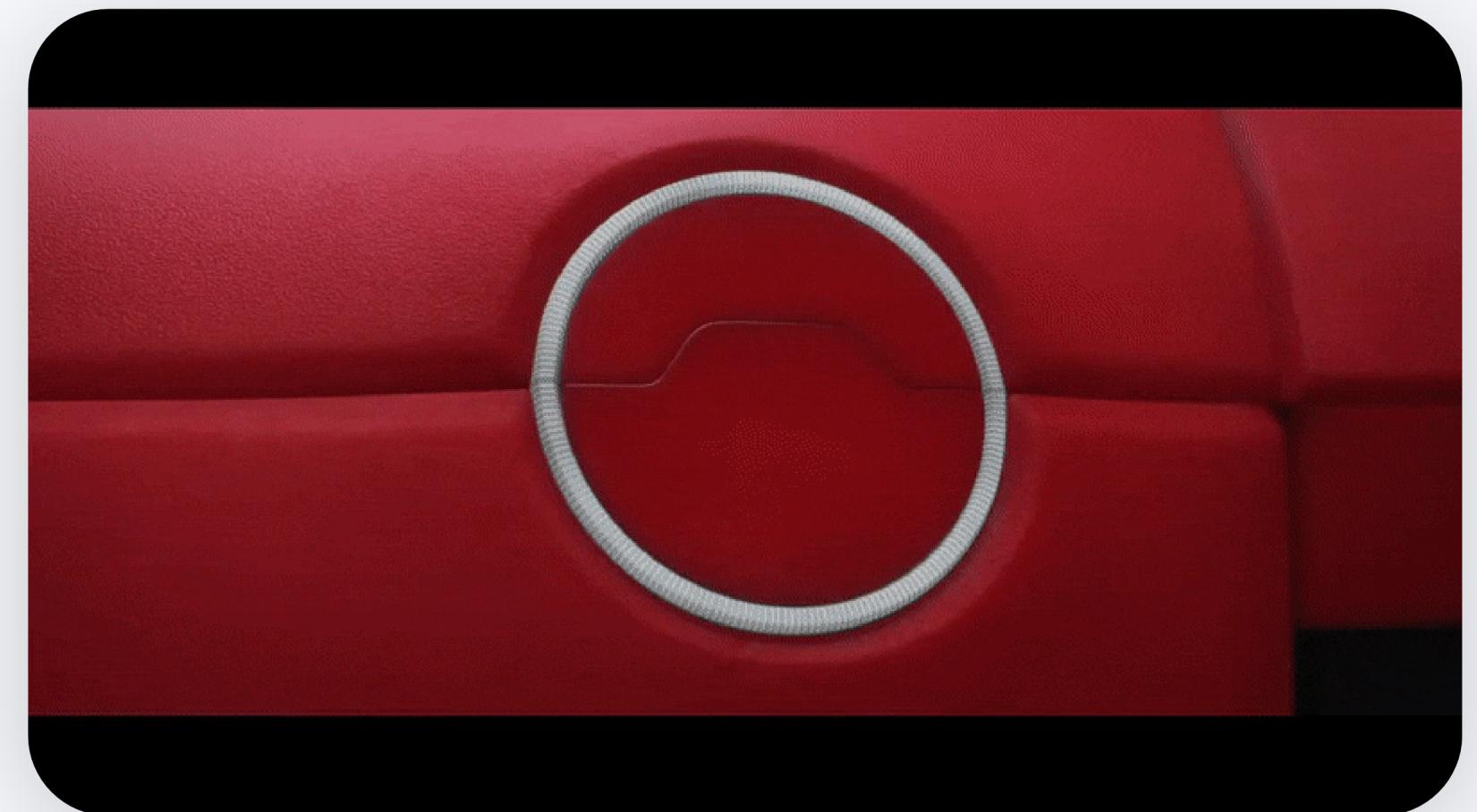
REAL EXAMPLE: [HTTPS://WWW.YOUTUBE.COM/WATCH?V=D1LJQJ203V4](https://www.youtube.com/watch?v=D1LJQJ203V4)

Your location



TAKEN FROM IPHONE 12 PRO COMMERCIAL VIDEO

Remote location



TAKEN FROM BIG HERO 6 MOVIE

Tasks/Functions of a Telepresence Robot

Live video feed



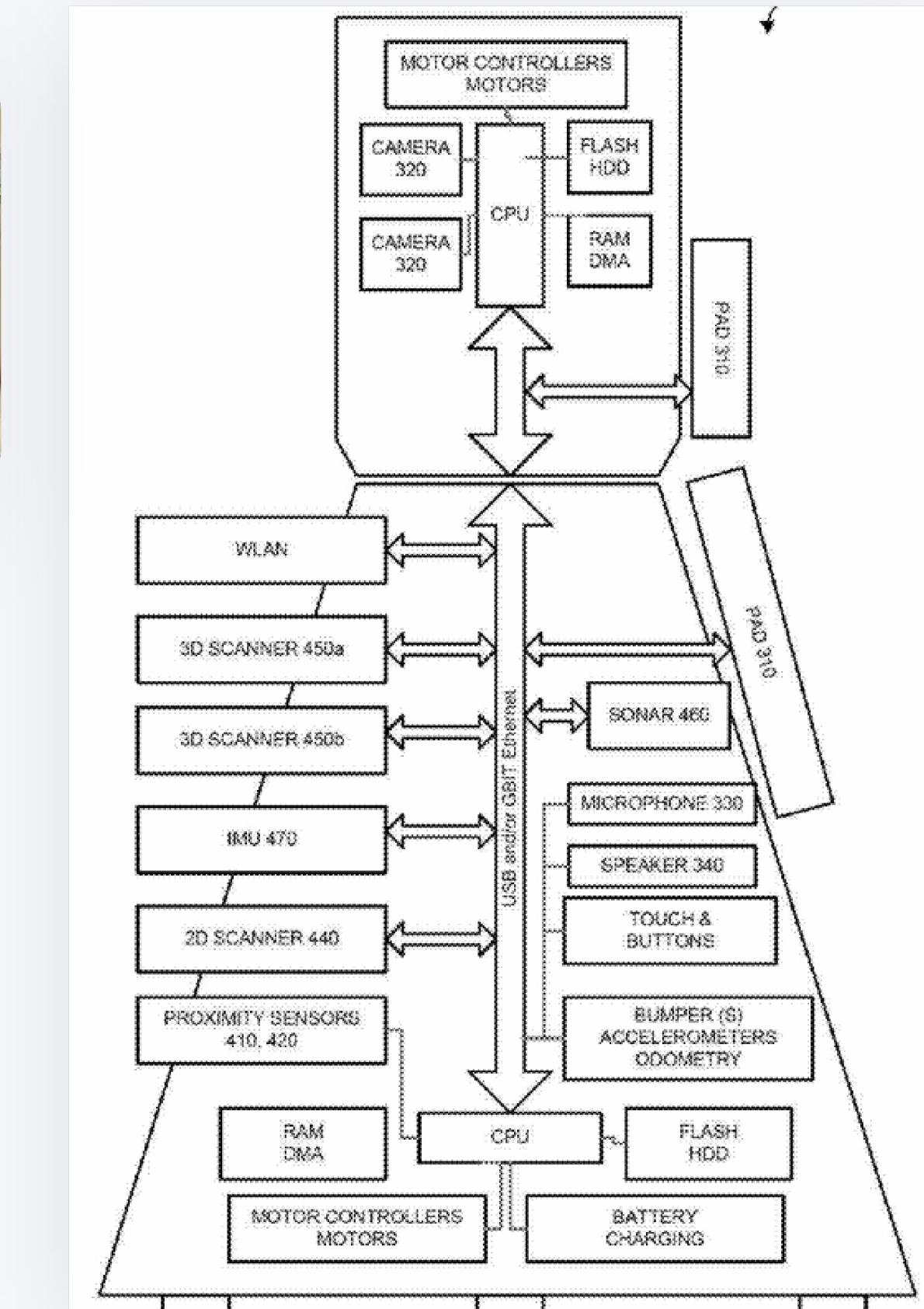
Mapping module

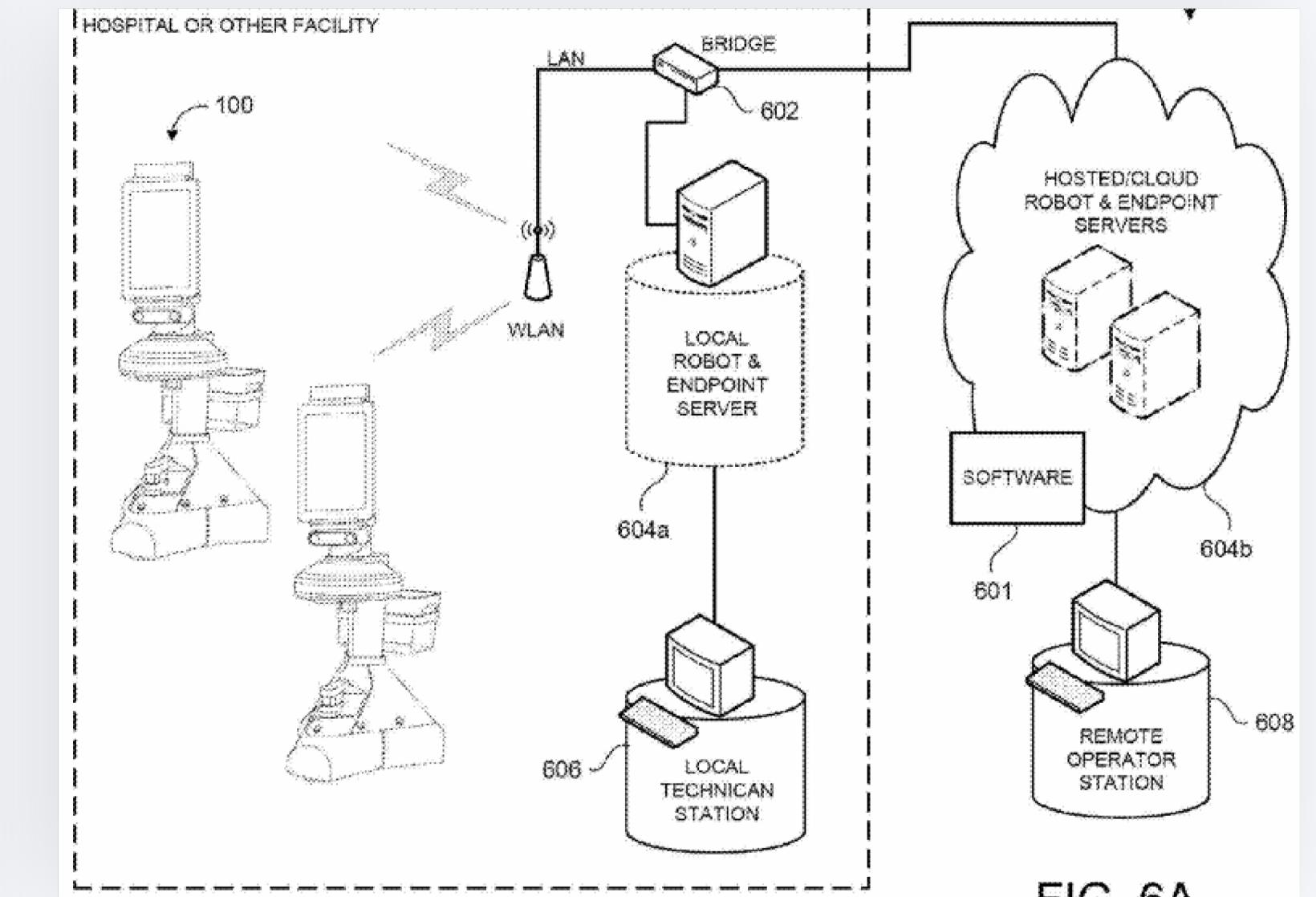
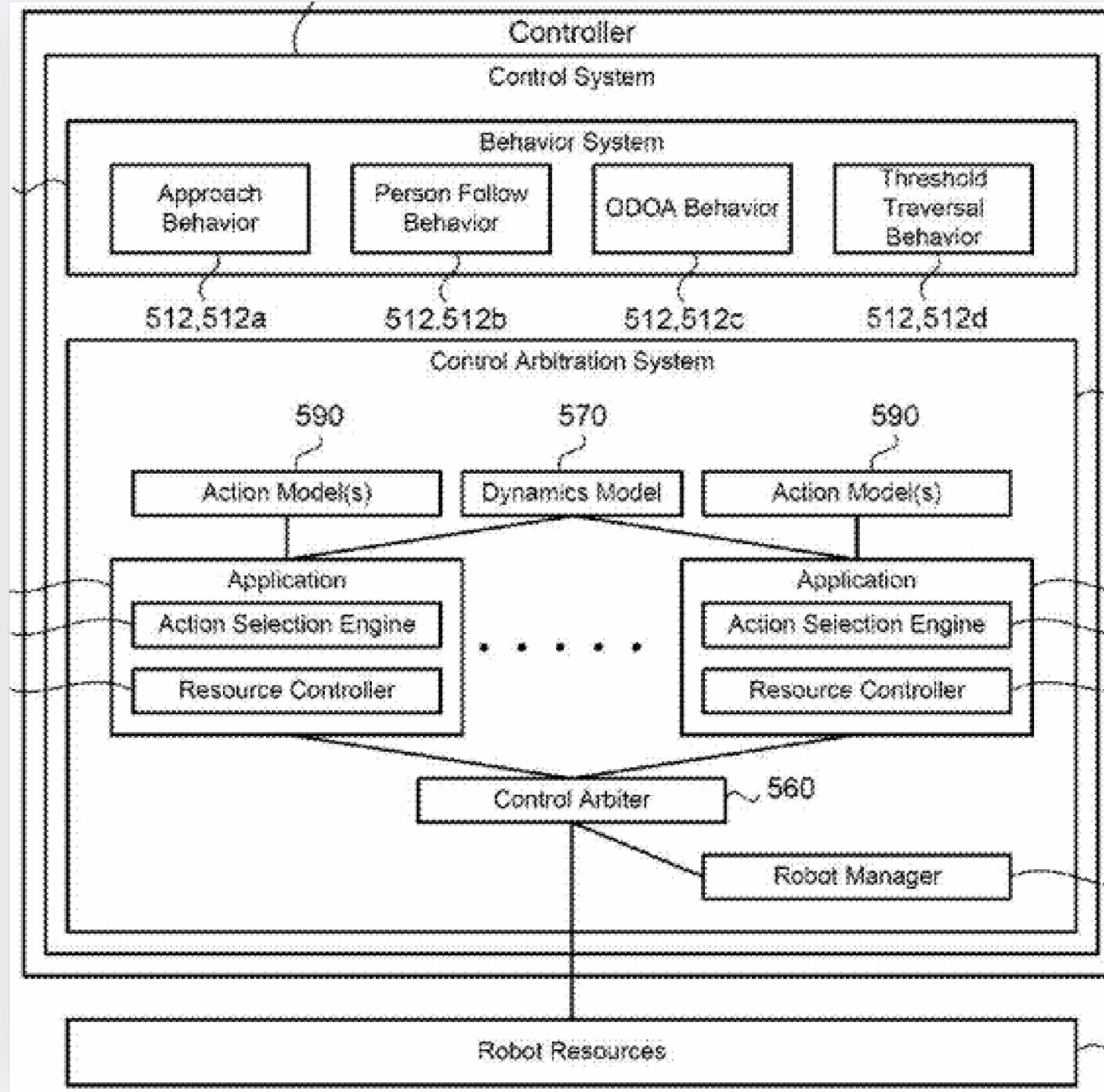


Automated navigation



User Interface







Thank you!

