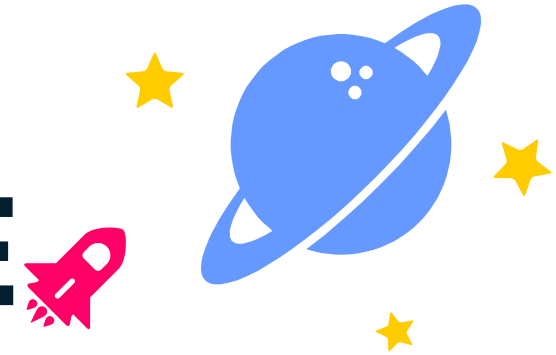
TELEROBOTIC HUMANOID

TELEROBOTICS

Telerobotics is the area of robotics concerned with the control of semi-autonomous robots from a distance, chiefly using Wireless network (like Wi-Fi, Bluetooth, the Deep Space Network, and similar) or tethered connections. It is a combination of two major subfields, teleoperation and telepresence.

OBJECTIVE



To develop a mini humanoid robot which can tracks the movement of a human and imitates the same .

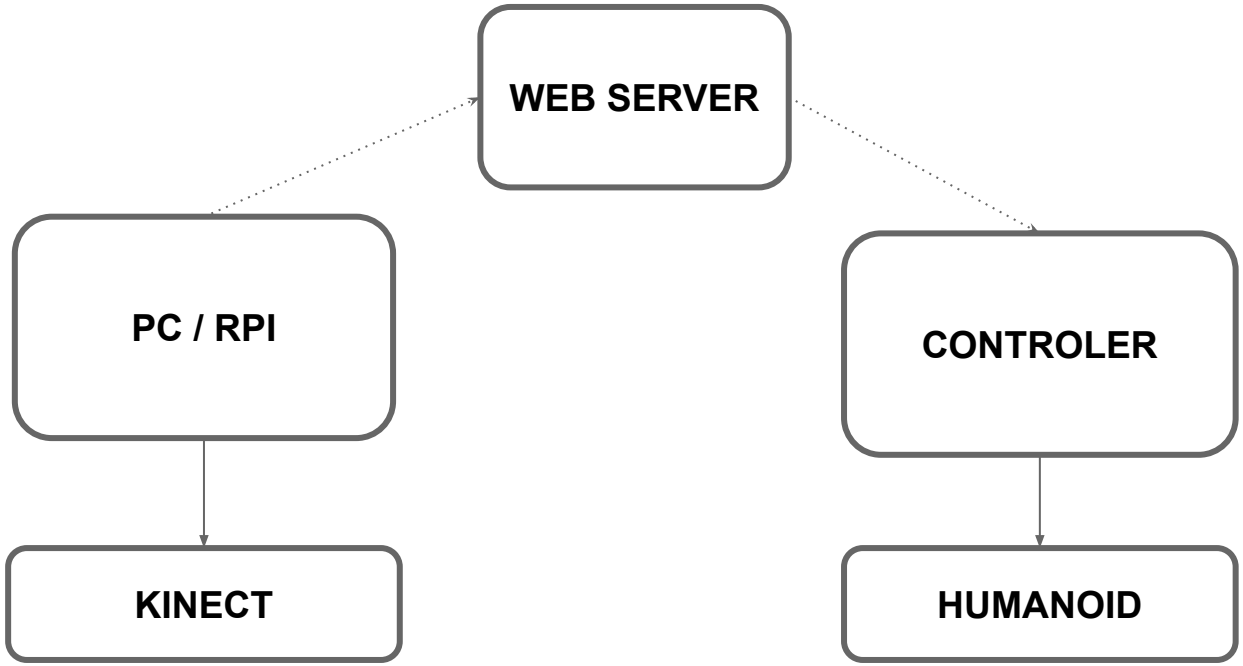
LITERATURE SURVEY

- Learned about existing tracking systems
- Sorted the merits and demerits of existing system
- Studied the components used in current system
- Did self research on how to improve the current system
- Formulated the idea and did some rough sketches
- Searched for the hardware available and ways to implement
- Studied the possibilities of our system

METHODOLOGY

- Searched the WEB
- Analysed projects done with kinect.
- Contacted professionals working on the same
- Referred existing projects
- Self research

BLOCK DIAGRAM



TRACKING THE SKELETON

Tracking the human skeleton is done with the help of a camera , depth sensor and an IR projector . With the help of measuring resemblance of the pattern it's mapped to a 14 points of the human body . With the help of necessary software the angle between the joints are calculated and uploaded to the web server

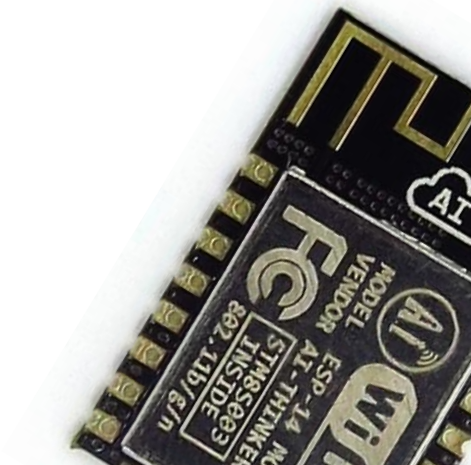
HARDWARE PLATFORM

Kinect

Kinect contains three vital pieces that work together to detect motion and create physical image on the screen: an RGB color VGA video camera, a depth sensor, and a multi-array microphone. The camera detects the red, green, and blue color components as well as body-type and facial features. It has a pixel resolution of 640x480 and a frame rate of 30 fps. The depth sensor contains a monochrome CMOS sensor and infrared projector that help create the 3D imagery throughout the room. It also measures the distance of each point of the player's body by transmitting invisible near-infrared light and measuring its "time of flight" after it reflects off the objects These detect and track 48 different points on each player's body and repeats 30 times every second. It is a combination of two major subfields, teleoperation and telepresence.

ESP 12-F

The ESP8266 is a low-cost Wi-Fi microchip with full TCP/IP stack and microcontroller capability produced by manufacturer Espressif Systems in Shanghai, China. The chip first came to the attention of western makers in August 2014 with the ESP-01 module, made by a third-party manufacturer Ai-Thinker.



PWM ANALOG SERVO

A servomotor is a rotary actuator or linear actuator that allows for precise control of angular or linear position, velocity and acceleration. It consists of a suitable motor coupled to a sensor for position feedback. It also requires a relatively sophisticated controller, often a dedicated module designed specifically for use with servomotors.

Servomotors are not a specific class of motor although the term servomotor is often used to refer to a motor suitable for use in a closed-loop control system.

3D PRINTER - ULTIMAKER 2

3D printing is any of various processes in which material is joined or solidified under computer control to create a three-dimensional object, with material being added together (such as liquid molecules or powder grains being fused together), typically layer by layer. 3D printed objects can have a very complex shape or geometry and are always produced starting from a digital 3D model or a CAD file.

SOFTWARE PLATFORM

FUSION 360

Fusion 360 free 3D CAD/CAM design software for students, educators, and academic institutions. Fusion 360 is available for Mac and PC. In our project we are using FUSION 360 for designing the parts to be 3D printed .

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PROCESS

Process Software is a premier supplier of communications software solutions to mission critical environments since 1984. With a loyal customer base of over 3,000 organizations, including Global 2000 and Fortune 1000 companies, Process Software has earned a strong reputation for meeting the stringent reliability and performance requirements of enterprise networks.

OPEN NI

OpenNI or Open Natural Interaction is an industry-led non-profit organization and open source software project focused on certifying and improving interoperability of natural user interfaces and organic user interfaces for Natural Interaction (NI) devices, applications that use those devices and middleware that facilitates access and use of such devices

ARDUINO IDE

The Arduino integrated development environment is a cross-platform application that is written in the programming language Java. It is used to write and upload programs to Arduino board. The source code for the IDE is released under the GNU General Public License

APPLICATIONS

- Augmented Reality
- Telerobotics
- Space Explorations
- Rescue missions
- Robotic surgery
- Remotely operated humanoids