



A SYSTEM TO ENHANCE SURGERY PROCEDURE

Autonomous Feedback Controller System (AFCS)

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ABSTRACT

The long distance robotic surgery is the technology that uses the virtual reality technology concept in which surgeon can directly connect to the robotic system which is away from the surgeon, and both are connected to each other with an autonomous feedback controller system. The system held in the middle of both these system, the AFCS system use the connection medium like internet for sending and receiving the feedback for continuous and smoother communication. This research will demonstrate a new idea for the future concept in which a system for a smoother communication used to improve our long range healthcare system. Here are the three main concept “user system”, “communication system”, and the “long range communication system”. VR is the concept that allows the surgeon to connect with the artificial virtual environment where the user uses many virtual things for completing various kind of task.

INTRODUCTION

This is an idea of processing the information or controlling the long range distance machine called a robotic system to perform the various tasks but in this research we are only presenting a system that make the proper communication. The word Virtual reality means to be present at a different place not physically but your movements can be mimicked at that virtual place so by this you can feel yourself at a different place at the same time. Virtual reality first used by “Morton Heilig” in 1962 he developed a machine called ‘sensorma’ to view the 3D movies for the entertainment purpose. After this “Jaron Lanier” in 1980’s in context to feel the virtual environment he developed goggles and gloves. Virtual reality is the technology by which a person can feel their presence in a virtually generated environment and also can control the things (living or non-living) of that place. Healthcare industry is the huge adopter of virtual reality in which we a new technique came which is robotic surgery. Robot assisted surgery is not the new thing in the medical line it is developing time to time. In 1985 PUMA 560 (Programmable Universal Machine For Assembly) was used in a brain biopsy procedure in which the robot inserted a needle in the brain of the patient for diagnose cancer to reduce the hand tremors that was the first robot used to help in the surgery procedure. That can rotate in six-axis and to provide accuracy in the result to view the inner section of the cancerous body part by providing continuous and different angle images.

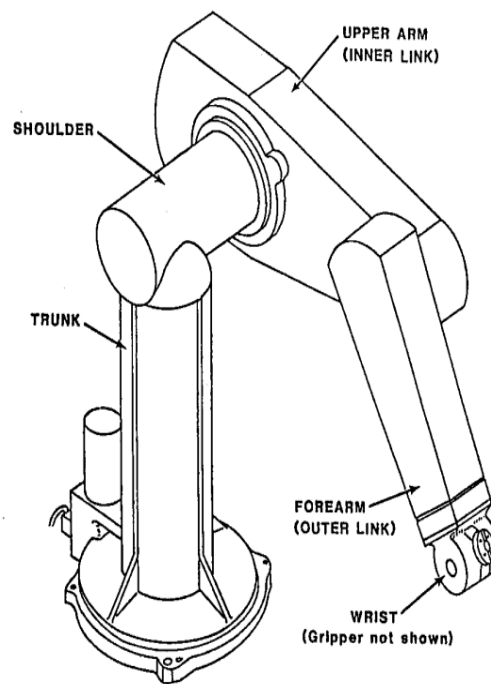


Fig: The six degree-of-freedom puma 560 robot manipulator

At the time of Covid-19 the telepresence technique came to help the doctors by this technique the doctors can easily understand the actual condition and the improvement in their patient health and can also interact with their patient remotely.

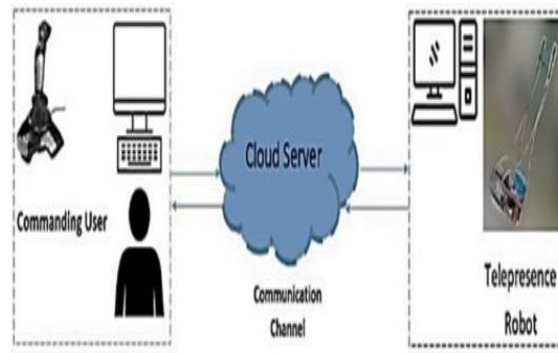


Fig: By this diagram i want to show you how it will look

LITERATURE SURVEY

In the world of technology modern changes are coming time to time as per the growing requirements. Before puma 560 it is not possible for the human to believe that a robot can help in the surgery procedure. The robotic involvement in the surgery procedure is now become popular.

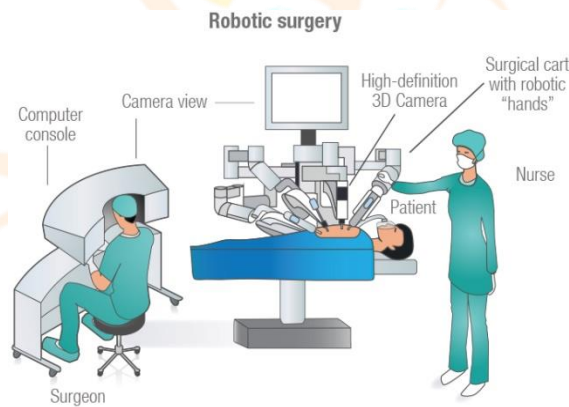


Fig: Robot helping in performing the surgery

Here in my research i found that when a user interact with the robot in context to perform some actions to get some feedback from the robotic device this will not able to provide continuous feedback. So. For this I tried in my research to explore this point and to provide the feedback smoother and continuous I made a system tool to resolve the problem of feedback system from the AFCS (autonomous feedback controller) Which will held in the middle of the client and the robotic system through a medium like internet.

The data (actions) will transfer from the client side in the form of signal, proceed through the middle system (AFCS) and in the form of packet it will be received at the receiver side.

OBJECTIVE

The main objective of this project is to provide smoother and continuous communication between the user and the connected long range robotic system.

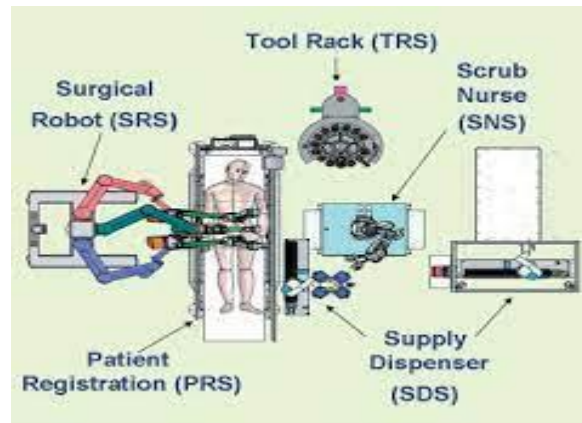


Fig: A representation of the surgical room

This is an idea that will generate better results while proceeding the robotic surgery this will require a proper architecture or technology, hardware & structural procedure for implementing it. This will help billions of people & also carry the healthcare industry at a next level.

Aspects related to virtual reality environment

- Immersion
- Sensory feedback
- Interactivity
- Virtual world

Immersion:

Immersion makes the feel more realistic using sound, graphical content, VR headset, 3D audio etc.

Sensory feedback

VR provide their user a virtual environment where the user can track and change their motion or movement by using vr gadgets. VR is now trying to improve on taste and smell to make the immersion more immersive.

Interactivity

A user can control the living and the non-living things of that virtual environment.

Virtual world

Vr technology makes a similar virtual environment for their user by the use of computer and vr gadgets to feel their user same as in the realistic world.

FUTURE SCOPE

The main scope of this is to provide the continuous feedback between the two systems that are connected to each other through a network and can be placed far from each other in such a form to get the smooth and continuous feedback from one place to the other place. so that, the improvements will came in the behavior of the robotic system.

This is a new step at the road of virtual reality and in the future this will boom the mind of the people as technology always do.



Fig: virtual reality in healthcare

CONCLUSION

This idea will make a futuristic system that will fulfill the need of user to get feedback more realistic and continuous.

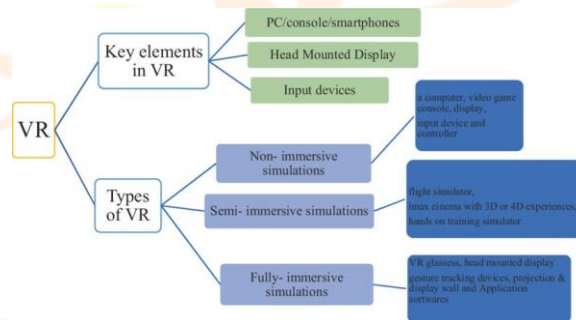


Fig: Key elements and types of virtual reality

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