Real-time control of robot arm based on hand tracking using leap motion sensing technology

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Declaration

I declare that the work contained in this thesis is my own, except where explicitly stated otherwise. In addition this work has not been submitted to obtain another degree or Professional qualification.

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For/Dedicated to/To our. . .

Our most Beloved Parents. May God Almighty give them long life and prosperous health.

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Abstract

Leap Motion sensor is ubiquitously manufactured by an American organization which usually runs by the name of Leap Motion, INC. It is an external computer hardware sensor that pragmatically operates via hand and fingers gestures as input. Unlike a mouse, it requires no physical contact. The production company is known to generate innovative software in 2016, which was peculiarly assembled for arm tracking via virtual reality. The Leap motion sensor is a type of proximity sensor that visualizes hand and its every minuscule joint movement. As per acknowledgment we have proposed an idea of using the Leap Motion sensor in an enhanced way to manipulate a robot arm. The plan here is to make robotic arm mimic the motion of the user's hand as, Leap motion takes motion as input and sends an output to the robotic arm to be visualized. Moreover, in order to achieve our desired state we have designed a pragmatic and enhanced wooden robotic arm to assist us to accomplish our requirements.

The Backing Ideology

An idea can be generated in various ways using theories, philosophical ideas and previous prescribed research. While, an idea does not exists regardless of an implementation. Here it needs to be divulged that the idea was spawned due to some research mechanism and work that has been implemented in the past but with the use of other technology such as KINECT and SOFTKINECT. While, we have found the LEAP MOTION device which can be much more pragmatic and enhanced in order to achieve this ideology.

Upcoming Era of a Development

Leap Motion sensor was initially considered to be of less importance and was not effortlessly accessible in underdeveloped nations. In any case, nowadays in the propelling universe of innovation, Leap motion is getting celebrated and is assumed to play fundamental part in numerous upcoming frameworks.

Additionally, because of its abated size and glorious precision clients lean toward it over different gadgets of such peculiar abilities. Moreover, it has turned into an obvious piece of installed frameworks every now and then. It has acquired unrest PCs and in future, it is anticipated to be piecework of the Mobile phones as well. These attributes illustrated above are all benefits of its abated size and elegant precision. It has an application store and is well known for some PC diversions. It has a circular scope of up to 0.9144 meters. It is just constrained to fingers, joints and hands gestures and movements. In conclusion, it is less expensive than other detecting gadgets which are briefly described in this context.

Chapter 1

Introduction

According to proposed thought and usage, this venture contains an exquisitely creative procedure. It is preferably progressive and comprises of more than one frameworks consolidated together. In this venture, a Leap Motion sensor that is equipped for detecting hand and fingers collaborative motions and development should be interfaced with a reasonably planned and built wooden Robotic arm and controlled separately. The configuration of the Robotic Arm will be similar to the hand signals that will be a contribution to the leap motion in the first place. Additionally, one might say that the Robotic arm will duplicate the development of hands and fingers motions of a human arm.

The Robotic arm outlined for this situation is nearly a human hand as well as light weight and has extraordinary rigidity all together for more collaboration with the desired scenario. The Robotic Arm will have the capacity to hold and will be adaptable to some degree with the end goal of evacuating friction which might bring about prominent fiasco to its structure.