

Transverse Lie with Robotics and Artificial Intelligence

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Abstract:

According to the medical condition in the ending weeks of pregnancy, the foetus babies often settled in position. In some rare cases, the baby can be seen in lying sideways position or in a transverse position. This position is known as malpresentation. The most common problem seen in early weeks of pregnancy is that when the babies are more mobile, most babies change their position into the head down position by the last trimester, But Sometimes it is different than the expected, the malpresentation is called transverse lie. It is almost difficult and problematic to deliver a transverse baby vaginally. There are too many complications for the baby and risk associated with women too. We are developing robotic hand by which the position of the baby can be sensed in the degrees and using that robotic hand, according to the requirement the position of the baby can be changed before delivery. In Our proposed work we are going to develop the artificial intelligence that can sense the position of the baby and using AI (Artificial intelligence) the surgery with the robotic hand can be performed accurately and with minimum risks.

Keywords: Degree of Freedom, Artificial Intelligence, LabVIEW, Robotic hand.

I. INTRODUCTION

A robotic arm consists of a mechanical structure that adjusts its form with the help of a group of electric motors. A robot arm functions are usually controlled through servo motors, pneumatic, or hydraulic actuators. Robotic arm always attempt to mimic movements similar to that of a human arm.

DOF (degrees of freedom) is mainly correlated to roll, yaw and pitch. Representation of these movements in 3D space can be shown as in Fig.1.

With today's technological advancements have facilitated the designing of a robotic hand to perform different tasks depending on the applications like gripping, spinning, welding etc. For example, robot arms can perform many tasks such as parts rotation and placement in automotive assembly lines. While designing a robotic hand, very close impersonation of the human hand is preferred in some critical situations, because nowadays, robots are even designed to carry out explosive demobilisation and bomb disposal.

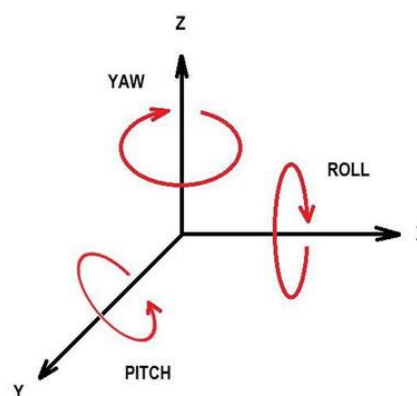


Figure 1 : Roll in 3D space, pitches, and yaw movements

The first digitally operated and programmable robot was invented by George Devolin 1954. The robot was ultimately called the Animate. The most important part in this robot is the robotic arm. Typically this robotic arm is constructed from seven metal pieces, which are linked with the help of six joints. An individual stepper motor connected to each joint is rotated through computerized controlled

motion and thereby control of entire robotic arm is achieved. Unlike ordinary motors, the stepper motors are known for precise motion control through exact increments. This enables the computer to move the arm very precisely for desired tasks. This process is performed repeatedly with the perfectly same movement. Advanced motion sensors are used in the robots to obtain precise movements with high accuracy.

An industrial robot having six joints can closely mimic a human arm. Like human arm, the robotic arm also has identical joints as a shoulder, an elbow and a wrist. The shoulder is mounted to a stationary base assembly rather than to a movable frame and the robot offers six degrees of freedom so that it can be pivoted in six different ways.

There are many different types of robotic arms. Based on their mechanical structure, they all are categorised into one of the six major categories listed below:

1. Cartesian robots: they have three different joints and they are coextensive with the typical X-Y-Z Cartesian axes.
2. Cylindrical arms: they have any number of joints and they operate on a cylindrical axis, which is normally rotating about one stationary bar.
3. Spherical arms: these robotic arms have joints which always allow full rotation throughout around all axis in a spherical range.
4. Robots having two parallel rotary joints: these robots allow full movement throughout a plane. Typical application of such robotic arms are for pick-and-place work.
5. Articulated robots: they are usually consist of three or more rotary joints and are used for intricate assembly operations.
6. Parallel robots: they have three synchronized prismatic or rotational joints. They are preferred for applications like tilting of heavy and delicate platforms.

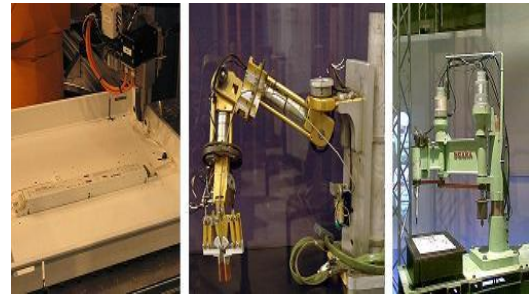


Figure 2: Gantry Robot, Articulated Robot, SCARA Robot

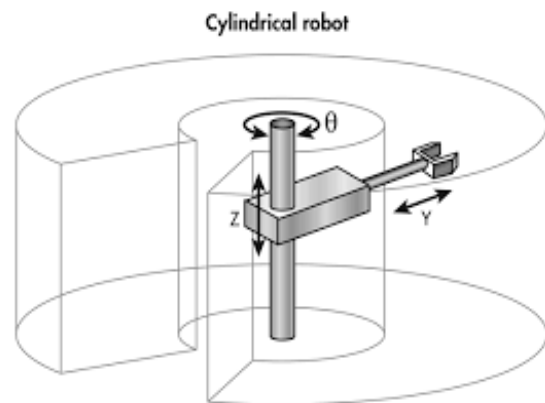


Figure 3 : Cylindrical Arm



Figure 4: Parallel Arm



Figure 5: Spherical Arm

II. PROPOSED METHOD

Artificial intelligence is the computer must understand people's natural language. Somewhat ephemeral because of its reference to the current state of computer science. In medical field artificial intelligence is recognize the disease by report. It avoid philosophical issues that dominated with physiology attempt to define the meaning of either artificial or intelligence. During last week of pregnancy most of cases baby position is head down and face is turned towards women's back. It's called anterior position and some cases baby position is head down but baby's face is turned towards women's stomach. It's called Posterior position. In this anterior convert to posterior by robotics hand decide which degree baby will rotate and which is suitable for baby. Robotics hand will sense the position and rotate. Sensing the variable friction finger surface to enable within hand manipulation via gripping and sliding.



Figure 6: Anterior Position



Figure 7: Posterior Position

Using robotic hand the baby's current position should be detected and shown on the monitor screen. Sensors will be mounted on the fingertips of robotic hand, which decide the degree of rotation for the baby.

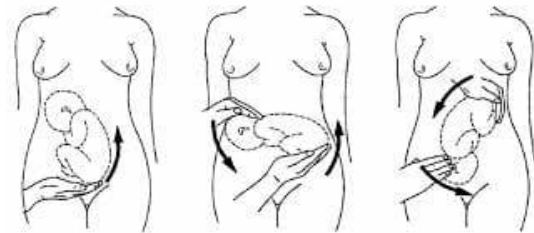


Figure 8 Baby Rotation via Robotic Hand

III. TECHNIQUES

Artificial intelligence (AI) techniques are becoming popular as an alternate approach to orthodox practises or as constituents of integrated systems. In the proposed paper the use of AI (artificial intelligence) is recommended to reduce operating and processing time with precise outcomes. The use of robotic hand in the real world for various applications is becoming more and more popular. To operate them, special hardware with sensors and effectors are needed. Artificial intelligence is implemented for robotic hand-eye coordination which is followed by a depiction of some of the remarkable outcomes in areas like operating systems, interfacing, pattern recognition and programming prototypes.

IV. RESULTS

We tried to simulate to get some results for our proposed technique using LabVIEW. The algorithm

and simulations shown below in figure through Virtual Instrument (VI).

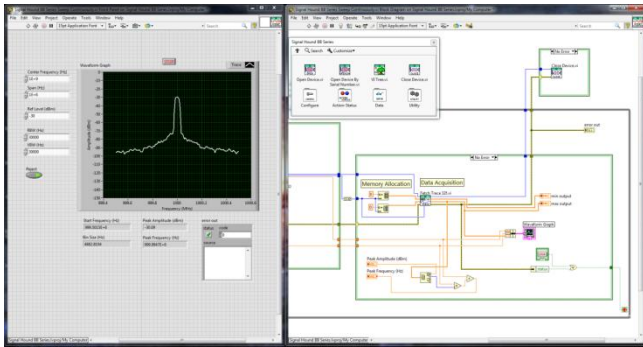


Figure 9: LabView panel

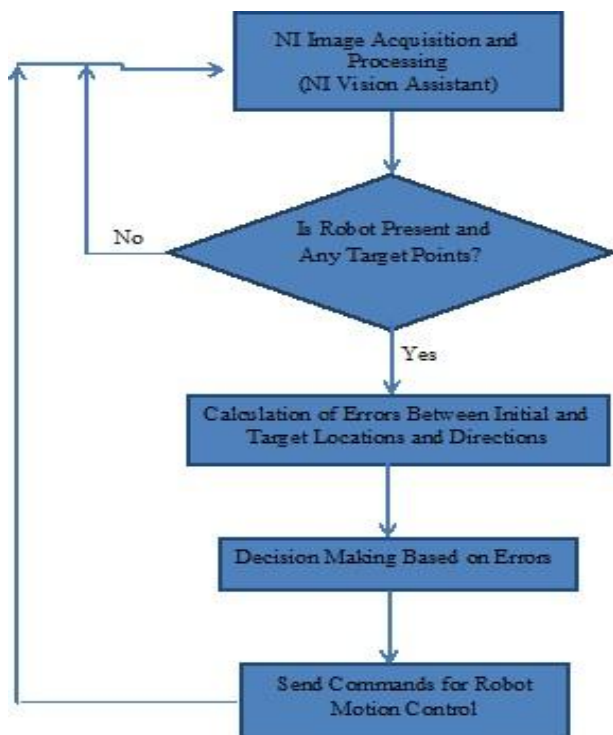


Figure 10: LabVIEW Program Flowchart

As we tried to make a way through the robotics to learn object recognition and genetic algorithm which will train the robot to identify and change the position of the baby according to requirement.

Get started with robotics and artificial intelligence.

- Apply simulation technique to give your robot on artificial personality.
- Understand object recognition using neural network and supervised learning tech.

- Pickup your robot to listen using natural language processing via an expert system.
- Use machine learning and computer vision to technique robot how to avoid obstacles.
- Understand path planning decision trees, and search algorithms in order to enhance robot.
- LabVIEW was used to movement of the robotic arm. In LabVIEW robotics platforms provides a standard hardware and software developments solution for designing robotics arm.



Figure 11: Robotics Hand

V. CONCLUSION

From the facts and discussions presented herewith it can be concluded that robots of the current generation have been used in fields isolated from the human society. This technique can be very useful in complicated cases. During Pregnancy if the baby changes the position in mother's womb, the situation becomes critical and it must be corrected as early as possible. If the baby position will be corrected as in anterior position, it will be beneficial for the mother as well as for the doctor. In the proposed method the doctor's hand will be replaced with a robotic arm, which with its optimal control will make the action painless and accurate.

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