

EASY TO POSITION VISION MOUNTING SYSTEM

MAKE IT REAL CAD ENGINEERING CHALLENGE

Vortex NEOWISE Change Up: 2020-2021 ITU ETA Foundation Samsun Doğa Science and Technology High School, TurkeyVEX Competitive Robotics Team

EASY TO POSITION VISION MOUNTING SYSTEM

Introduction

Using sensors in Vex is an essential part of positioning in the design process to increase robot performance. When using Vision, an important area should be allocated and an area should be created at a suitable angle according to the Vision. The current positioning system for Vision has two screw inputs, which is not enough to give the correct values, and structurally we are constantly faced with the fact that the sensors screw inputs are broken. The Vision mounting system we designed is a positionable Vision mounting system to transfer data more efficiently to our robot, to provide ease of assembly according to use in different matches, and to adjust the angle of the Vision. In the assembly of parts, it can be connected to all sizes of c-channels supplied from Vex. The angular differences in the purpose of the part positioning (Image1,Image2) are shown. This allows the direct Vision to record better images. Our design can optionally move from 0 to 180 degrees on the X and y axis. This action can be fixed according to the desired result. This indicates that it is multifunctional.



Image1: Normal positioning of real-size Vision in Fusion 360.



Image2: Positioning Vision in real dimensions in Fusion 360 in our design.

EASY TO POSITION VISION MOUNTING SYSTEM



Introduction Continued

Images3.1-3.2: Images of tried parts for the Y axis.

Image3.1: Left- front view of the part designed for the Y-axis,

İmage3.2: Right-back view of the part designed for the Y-axis.





Image4.1-4.2: Images of tried parts for the X-axis.

image4.1: Left-top view of the part designed for the X-axis,

Image4.2: Right - bottom view of the part designed for the X axis.





Images5.1-5.2: Images of tried parts for the Y and X axis.

Image5.1: Left-front view of the part designed for the X-axis,

Image5.2: Right - Back view of the part designed for Y and X axis.



3

EASY TO POSITION VISION MOUNTING SYSTEM

Function

The easy to position vision mounting system created will be used to directly transfer more efficient data to our robot, to provide ease of assembly according to the usage function in different matches and to adjust the angle of the vision sensor. The current process to mount a vision sensor on the Y-axis requires two screws(labeled1,5) to establish the connection between the vision sensor case and the part that provides vertical axis movement. At the same time, if we want to see the functionality on the X-axis, the part that moves on the horizontal axis, the part that moves on the vertical axis, is combined with two screws(labeled2,4). And when we can stop the part moving on the horizontal axis to the desired position by means of the mechanical brake(3labels). Thanks to these easy assemblies that our part has provided us with, we can use our vision sensor in different strategies, in different positions, at different angles... between matches. This, in turn, shows the functionality of the 0 to 180 degree positioning feature.



The part that allows it to move on the horizontal axis.

The part that

ScrewPositions

EASY TO POSITION VISION MOUNTING SYSTEM

DESİGN

V5 vision was referenced from Autodesk Inventor to create the vision Assembly. This reference allowed us to make no changes to the structure of our vision case. First, a vision-sized bodi was created, the entries in vision were removed to see the geometry of everything that needed to be designed around it(**image6**). Among these inputs were the molds of V5 SmartPort, VEXIQ SmartPort, USBMicro, power button inputs. These patterns were measured and holes were created in their position in the vision body we created(image7) our part was created that will provide movement on the Y-axis. Then, screw areas were created on the body to mount the Y axis part to the visiona. Printed, tested on the robot. Then it was decided that the model had to move on the X-axis in other positions. In this way, the model will be able to move on the Y-axis(image8), X-axis(image9), both the X and Y-axis(image10). So a piece was created that would provide movement in the X-axis. Our designs were drawn in real sizes in Fusion 360.



image8: The labeled diagram of vision parts is taken into account when designing an assembly.



image9: The appearance of the body we created above the vision in real dimensions. Bottom view(left), back and top view (right)

EASY TO POSITION VISION MOUNTING SYSTEM

Design Continued



Image10: The image of the part that provides Y axis movement in our design in Fusion 360.





Image11: The image of the part that provides X axis movement in our design in Fusion 360.

Note: The screw in the labeled part is the mechanical brake of movement in the X axis.

Image12: The image of the part in Fusion 360 that provides movement on both the Y axis and the X axis in our designv

Maybe say last view.

EASY TO POSITION VISION MOUNTING SYSTEM

Conclusion

In this project, we learned about special gimbal designs, how assembly processes consist of systems, the rotation system of impellers in the internal system and how impeller transfers are. 3D design software is the fundamental part of the design process. For those involved in a competitive robotics team, 3D design software is an integral part of the robot design process. We hope to maximize this technology to enable us to create more advanced, custom parts. Team members have previously received internships due to their ability to use 3D design software such as Autodesk Inventor, and this internship has affected both their lives and their current career opportunities. Autodesk Inventor and other Autodesk 3D design software will continue to open doors for our team members.





SCAN ME