

STABILISATION OF A PAN-AND-TILT UNIT HOLDING A CAMERA

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OBJECTIVES

Current code will be ported to the new platform. In this case it is Raspberry Pi minicomputer, which has required interfaces for both PTU and inclinometer connection. The following were identified as necessary tasks to complete the project:

1. New platform configuration
2. Current code porting
3. Get readings from the inclinometer
4. PTU TASS protocol test and improvements
5. Main control unit needs to be built

INTRODUCTION

Pan-and-Tilt Unit (PTU) holding a panoramic camera is stabilized using gyroscopes. One of the problems of these is that they tend to drift and therefore need to be regularly corrected to ensure the camera stays vertical. This problem may be overcome by providing inclination data from another more reliable source like industrial inclinometer. The project is about building a small hardware module which will take full control over the PTU and will incorporate functionality to stabilize PTU based on the data from the inclinometer as well as provide additional functionality.

RESULTS SO FAR

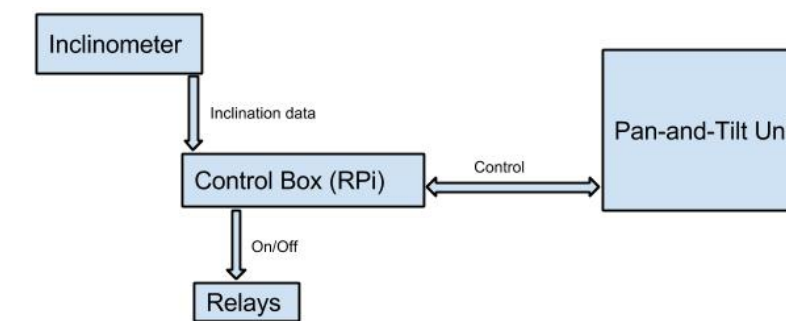


Figure 1: Connection model

The figure 1 shows the connection method

that was chosen to interconnect all parts. At the moment inclinometer and relays work fine and are ready for the integration into the overall system. Currently work is undertaken to extend and improve functionality of the TASS protocol which is used to interact with the PTU. The control box which consists of raspberry pi has functionality to interact with the inclinometer and relays, as well as responds to the connected client commands.

MATERIALS & METHODS

For this project I adapted Feature Driven Development methodology. It has been chosen because it will allow to deliver tangible, working software repeatedly in a timely manner at each stage of the project.

At the initial stage of the project consultations with the project supervisor were conducted to understand the root of the problem. Possible solutions, including advantages and disadvantages, were discussed and shaped in the further meetings.

Further research was made to understand the problems with gyroscopes and why they fail to provide accurate information. PTU data sheets and manuals were examined to find the path for possible solutions.

CONCLUSION

At the moment there are separate working parts. There is still much to do. The PTU TASS protocol needs to be improved to allow additional functionality. The main part of the application, which makes calculations based on data from the PTU and inclinometer, is still to be written.

REFERENCES

- [1] Glenn J. Turner. *Gyroscopes: An Introduction for Students, Engineers and Pilots*. Brightfusion Ltd, 1st edition, 2007-04-01.
- [2] Pavel Ripka and Alois Típek. *Modern Sensors Handbook*. *Journal title*, 2010-01-05.

FUTHER RESEARCH

In future alternative methods will be researched to allow stabilization with less hardware overhead.

CONTACT INFORMATION

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