COPTERHACK 2021

SERVIÇO NACIONAL DE APRENDIZAGEM INDUSTRIAL

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RAILWAYS INSPECTION DRONE - Report. 02

ARARAQUARA - SÃO PAULO - BRAZIL

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1 Introduction

Since last month our team has been trying to get in touch with companies in the railway area to establish possible partnerships in order to better develop our Project.

After some related research we came to the conclusion that the company RUMO would be the best partnership for the development of this project, considering that it is responsible for rail transport in most of our state and has a hub in our city which facilitates access physicist.

Figura 1 - RUMO TRAIN

After some conversations with internal contacts in the company we got permission to develop the project and run tests using the company's infrastructure

2 Equipment

to carry out the first tests, some dimensions and heights necessary to enable obtaining good photographs were calculated Our team could conclude that a drone with good freedom of flight and stability would be necessary since it would be ready for use in adverse situations and locations therefore, it would have to be in addition to being very resistant, have good stabilization and easy piloting, since it will not be operated by professional pilots, but by railway professionals as train drivers. In addition, it would also be necessary to have a quality camera enabling the obtaining of good images for analysis.

2.1 camera

following these basic needs first our team focused on the special camera that would be the main project, the chosen camera was an action camera model with high resistance following the standard already known from GO PRO.

Figura 2 - GO PRO HERO 4

This type of camera was chosen because in addition to its resistance to adverse situations it still has a compact size and excellent image, thus bringing together all the desired characteristics, allied to an easy operation and universal fit. after a lot of research we also defined that the camera should have wi-fi resources to facilitate piloting and operation, in addition to allowing the pilot to view the images he is capturing, thus maximizing the quality and efficiency of the process

2.2 Gimbal

Our team also decided to keep the initial idea of inserting a gimbal in the frame to be projected that would allow not only the stabilization of the camera for better images but also the alteration of the photography angle, thus allowing more possibilities of capturing images and features

Figura 3 - Gimbal 2 axis

We could also see that a common 2-axis gimbal would be enough for the application we want, it still has to be able to load gopro without problems, without influencing the movements.

both equipments have already been defined and entered into a purchase process at our institution, but due to the holiday season the process naturally collapses, so as not to waste time our team is waiting for the process to end and the equipments are purchased to start prototyping and testing

3 frame development.

At the moment our team is working on the possibilities of developing a frame capable of functioning as diversity of the hypotheses as to which it will be exposed,

this development is underway in the phase of choosing the frame model and material to be used in the production.