A Low-cost Solution for Obtaining Remote Sensing Images.

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Abstract. This paper presents a low-cost system based on kites to obtain remote sensing images. This low altitude images have interesting properties to application on areas with high tax of clouds covering or precision agriculture.

1 Introduction

To obtain multispectral images of remote sensing at some areas of our planet is difficult because of clouds covering. At seabord of brazilian northest, for example, this problem obstruct the utilization of multispectral images. Technical solutions exist, but they are expensive, as images of Sintetic Aberture Radar (SAR) or sensors transported by small planes as ultralight aircraft [2]. Other problem is that satellites do not get informations on an area in short intervals of time or on short areas. Then, it is very difficult work applications as precision agriculture at small areas, which requires several images acquired in regular intervals of time.

Kite Aerial Photography (KAP) is utilized by hob-bist to take pictures at low altitude at long time. Arthur Batut took pictures in France at 1889 with a kite [1]. However, there are problems yet: the operator does not know if pictures will be taken with the object of interest. Several pictures are lost because these problems. Thus, KAP is expensive to take good pictures to research and we cannot guarantee obtain good pictures at small intervals of time to the same area.

In this paper, we are proposing a low-cost solution to obtain low altitude video images using kites with micro-cameras. The images can be visualized in real-time and we can selected images taking frames of video. These selected images has high-resolution and low-cost per image. Pre-processing of this images is minimum and they can be obtained several times if we need. They can be utilized to experiments in precision agriculture and research at areas with clouds covering (see www.de.ufpb.br/~ronel/kite for more details).

2 The system

The delta-conyne kite is a combination delta and triangular box kite. This kite is very stable fliers in light wind. Large delta-conyne is utilized for light or moderate wind. We are using a large delta-conyne kite with 3.5 meters of base and 2.5 meters long.

Figure 1: Image aquisition diagram

A micro-video camera with RF transmitter (2) is fixed at kite's (1) line. This camera sends video to a notebook (7) equipped with a commercial RF recep-tor (3,4) connected to USB port (5). The user can capture frames of video (6) for analysis with appropriated software, as it is showing in Figure 1. This set is obtaining satisfactory results to capture good remote sensing images. The great advantage of this system is its cost lower to US$ 300.00 (not including notebook). We are researching now a bi-spectral sensor combining visible and infra-red video-cameras.

References
