

# AVITRACK



Contract n° AST3-CT-2003-502818

## Task.2.2 Handling operations, representatives videos

**Abstract:** This document presents the implementation of the video sensors on the Toulouse-Blagnac Airport, and the first handling operations video sequences recording.



## Task 2.2

### Handling operations, representatives videos

#### 1. INTRODUCTION

The work package 2, Sensors and Video Device, contains the research and the installation of the specific equipments for the video surveillance of the apron. The objective is to record videos, representative of the apron ground operations that can be exploited by the image processing and understanding modules.

ARC and Silogic collaborated in relation with the Toulouse airport services for the integration of all the equipment in the airport. The implementations was previously studied and validated in the task 2.1. This document presents now the result of the installation and the adjustment of all the video surveillance system. After the installation, for the exploitation of the video data by the modules of tracking and understanding, Silogic processed to the calibration task.

Finally, SILOGIC start the turnover recording, for the video data constitution and data diffusion to the partners. For the valorisation of the records all along the project, SILOGIC integrates a tool for the management of the database of video sequences.

### 2. INSTALLATION

The sensors were disposed around the apron. The outputs of the camera were linked to the technical room (Figure 2). The encoder was then joined by fiber optic to the operational room where Silogic has a free access to visualize and record the eight cameras ( Figure 3). We may also, with the remote camera control, change the parameters of the camera (iris control, gain ...).



Figure 1. Sensors disposed for the Apron observation.



Figure 2 . Technical room & Figure 3. Operation room, visualization of the cameras fields of view



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### 3. HANDLING OPERATIONS VIDEO SEQUENCES RECORDING

The sensors had been pointed referring the previous task results 2.1 concerning the 'Sensors studies' using the field of view CAD simulation of each camera.

All the efforts and the AVITRACK first tasks, reach one of the first objective: the acquisition of eight simultaneous videos, of the apron operations, all around the aircraft on a real operational site.

SILOGIC records all the video sequences on Hard disk, checks and classifies all the sequences then archives and diffuses the data to the partners.

### 4. CALIBRATION

A camera projects the surrounding 3D scene into a planar 2D image, and this projection (mapping) depends on the camera's geometric, spatial and optical properties or parameters. *Camera calibration* is the process of learning these parameters, in order to be able to describe the 3D-to-2D mapping of the camera system.

Silogic realised the cameras calibration. The results of the calibration, that is to say the matrix of transformation from 3D to 2D world will be contained in xml file. All these xml files of the cameras calibration will be managed by the Model module manager in way to reproduce possible modifications on all the modules (tracking, understanding ...).

All the pre-requirements for the recording of the video sequences are now available for the rest of the work. Silogic was in charge of all the preparation of the data (video sequences): the adjustment of the cameras and the calibration process. The second step of its work, at this point, is the recording of whole stopover to permit to the University of Reading, the INRIA and PRIP working on.

### 5. VIDEO DATABASE

To optimise the exploitation of the data all along the AVITRACK project, Silogic decided to create a database containing all the video characteristics that it burned to be able, in the future, to retrieve specific sequences. Silogic team did the video database with Microsoft Access and updates it each time that it burns a DVD.

The video database sequences are annotated considering for example, the weather conditions, the weather conditions, light of the scene, aircraft type, particular handling operations observed... SILOGIC realized short video shots, segmenting the entire video, corresponding to specific operations, like the GPU arrival (short operation before the aircraft arrival), the tanker or loader arrival. The "thematic sequences" are identified and classified.

## 6. APRON'S IMAGES



Example of night vision



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## 7. CONCLUSION

All the installation of the equipments to prepare the recording of sequences was done to permit the future tasks to start. Silogic will continue to record video sequences, to send them to partners and will maintain the database up-to-date. The work package 2.2 was the base of the work of the researches part of the project because it provides the raw data, the video sequences.

We will record for the validation of each handling operation supervision a few sequences related to it, then we will be able to work on the whole turnover.

The efforts and the resources of all the AVITRACK partners, allow the operational implantation of the ARC equipment on the Toulouse-Blagnac airport.