

UAV programming

Bibliographic study on the UAV's world

Research of different softwares and open source folders

Flight learning on simulator, reduced model and on the project UAV

Understanding of the language C source code, simplification and algorithms extraction

Study of possible instrumentation to perform a position control in the context of an automatic mapping mission

WHERE DO WE FLY THE MOST IN THE WORLD ?



- | | |
|--------------------|------------------|
| 1 - United states | 6 - Spain |
| 2 - United Kingdom | 7 - Germany |
| 3 - France | 8 - Mexico |
| 4 - Switzerland | 9 - Brasil |
| 5 - Italy | 10 - Netherlands |



Military operation



Transport



Mapping



Observation Research



Medias



Natural Disaster



Games Hobby

INTRODUCTION

By definition, a UAV is an aircraft able to fly and perform one mission without human presence on board. If at the beginning the idea of these systems was to avoid risking the life of a pilot during a mission, they have now both military and civil uses. Indeed, they act on a lot of fields and there exists two categories.

Rotorcraft

Highlights

Stationary flight
Manageable
Versatility

Drawbacks

Limited battery life
Assembly complexity

Fixed wing

Highlights

High battery life
Range
Light

Drawbacks

Limited applications
Low weight of the charge

Phantom DJI

Training on a professional flight simulator



Héli-X6

It uses mathematical methods to reproduce some real conditions allowing us to perform in various exercices to improve our level for the UAV control



MultiiWii copter

Do it Yourself oriented principle

The purpose of the project is to develop our own configuration thanks to an open source code on programming software

MultiiWii



Husban X4

Real reduced RTF (Ready to fly) model

Nervous and easy to handle quadcopter which permitted us to pilot a real UAV with approximately the same features as a MultiiWii copter



Learning step by step

UAV key number in France

150,000 jobs in 5 years on the french market



2012

62M€

2013

93M€

2015

288M€

ARE YOU READY FOR AN IMMERSIVE FLIGHT ?

What are these UAV which are just about to revolutionize our lives ?



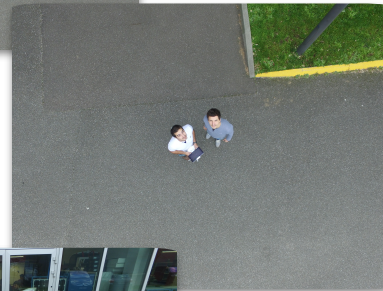


Future improvements

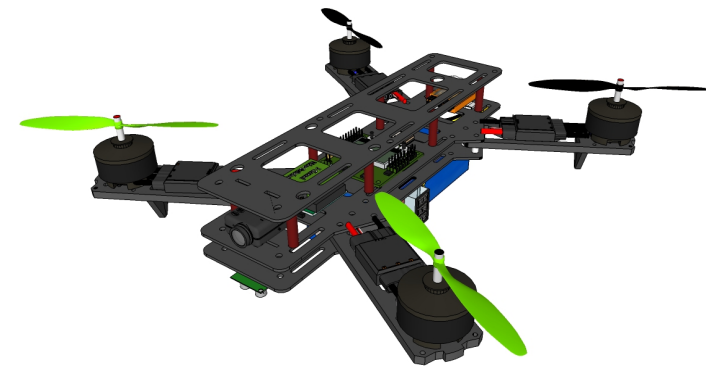
Wall mapping

Carrying out a position of a UAV by using sensors
to perform a wall monitoring by a constant distance

Taking pictures with the UAV to create a 3D model
of the structure thanks to suitable software



Picture taken by Phantom UAV



UAV programming



Keynote contents

- Specifications
- What's a UAV ?
- History
- Key figures
- Using and categories
- Law
- Composition
- Functionning
- Radio transmitter
- Flight controller
- Computing code
- UAV description
- Improvement

Project carried out by :

- Loïc Prabel
Methods process engineer
Adhex Technologies



- Thomas L'helgoual'ch
Project Manager
Santerne Aquitaine



Loïc Prabel - Thomas L'helgoual'ch

Guided by Bertrand Boyer

FIP GE Department 2013-2016

INSA

INSTITUT NATIONAL
DES SCIENCES
APPLIQUÉES
STRASBOURG

24 Boulevard de la Victoire
67000 Strasbourg
03 88 14 47 00

INSA

INSTITUT NATIONAL
DES SCIENCES
APPLIQUÉES
STRASBOURG