University of Liège

Faculty of Applied Science

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Autonomous navigation of a UAV in an indoor environment

Graduation Studies conducted for obtaining the Master's degree in Computer Engineering

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Academic year 2020-2021

Abstract

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by Maxime Meurisse

Nowadays, UAVs are used in a wide range of tasks and are highly valued in a variety of sectors: aerial imaging, filming, area exploration, etc. Their popularity has grown steadily in recent years. Indeed, they are small, fast and much cheaper than the technologies used before them.

However, a UAV requires a trained and experienced pilot. This may be a limitation to the automation of UAVs for certain tasks such as parcel delivery, for example. Moving UAVs without human intervention is a real technical challenge.

Acknowledgements

Acknowledgements to do

Contents

Chapter 1

Introduction

expliquer la problématique, le contexte et les difficultés, les différents élements abordés dans ce travail et la structure du document

Chapter 2

State of the Art

revue de la littérature parcourure et resumé des techniques principales (vision based, RL)

Chapter 3

Controllers

to do

Chapter 4

Simulated environment

expliquer toutes les spécificités, contrainte et autres caractéristiques propres à un environnement intérieur (et plus précisement des couloirs). aborder la modélisation et représentation de l'environnement.

Chapter 5

Autonomous navigation

lister les problèmes (aller d'un point A à un point B, batterie) et les solutions testées

1. naive navigation algorithm

idées: - vision-based navigation algorithm - pure computer vision - mixed - battery problem

Chapter 6

Adaptation to a real drone

aborder le dji tello edu, ses caractéristiques physiques, ses imprécisions et les impacts de ces dernières.

Chapter 7

Future of autonomous UAVs

d'un point de vue technique mais aussi juridique

Chapter 8

Conclusion and future work

aborder le RL ?

Appendix A

Appendix chapter

to do