Technical University of Crete

Diploma Thesis

Design and Implementation of a Low Cost Embedded System for Localization of Drones Flying in Swarms

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TECHNICAL UNIVERSITY OF CRETE

Abstract

School of Electrical and Computer Engineering

Electrical and Computer Engineer

Design and Implementation of a Low Cost Embedded System for Localization of Drones Flying in Swarms

by Christos Spyridakis

TODO: English ...

ΠΟΛΥΤΕΧΝΕΙΟ ΚΡΗΤΗΣ

Περίληψη

Σχολή Ηλεκτρολόγων Μηχανικών και Μηχανικών Υπολογιστών

Ηλεκτρολόγος Μηχανικός και Μηχανικός Υπολογιστών

Σχεδίαση και Υλοποίηση Ενσωματωμένου Συστήματος Χαμηλού Κόστους για Εύρεση Θέσης μη Επανδρωμένων Αεροσκαφών που Πετούν σε Σχηματισμό

από τον Χρήστο Σπυριδακη

TODO: Ελληνικά ...

Acknowledgements

TODO: Add Acknowledgements

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List of Algorithms

Physical Constants

Speed of Light $\quad c_0 = 2.997\,924\,58 \times 10^8\,\mathrm{m\,s^{-1}}$ (exact)

List of Symbols

a	distance	m
ω	angular frequency	rad

List of Abbreviations

MCU	**M**icro **C**ontroller **U**nit
MPU	**M**icro **P**rocessor **U**nit
UAV	**U**nmanned **A**erial **V**ehicle
VTOL	**V**ertically **H**over, **T**ake-off, and **L**and
ESC	**E**lectronic **S**peed **C**ontrol
IMU	**I**ntertial **M**easurement **U**nit
GPS	**G**lobal **P**ositioning **S**ystem
FPV	**F**irst **P**erson **V**iew
WSN	**W**ireless **S**ensor **N**etworks
UGV	**U**nmanned **G**round **V**ehicle
MAV	**M**icro **A**erial **V**ehicle

Dedicated to those people who have helped me be the person I am today...

Chapter 1

Introduction

1.1 Motivation

1.2 Scientific Goals and Contributions

1.3 Thesis Outline

- **Chapter 2 - Theoretical Background:**
- **Chapter 3 - Related Work:**
- **Chapter 4 - Design Features and Implementation:**
- **Chapter 5 - Applications and Usage Examples:**
- **Chapter 6 - Experiments and Results:**
- **Chapter 7 - Conclusions and Future Work:**

Chapter 2

Theoretical Background

”Let no one ignorant of geometry enter”

Plato

Chapter 3

Related Work

"This is where technology is now, imagine where we can go in the future"

Timothy Chung

3.1 Thesis Approach

This should be the last section

Chapter 4

Design Features and Implementation

”

Chapter 5

Applications and Usage Examples

Chapter 6

Experiments and Results

Chapter 7

Conclusions and Future Work