

ROS-Based Multi-Agent Systems Control Hybrid Testbed (MASCOT)

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Abstract—

I. INTRODUCTION

II. PRELIMINARIES

A. Quadcopter Dynamics

B. Quadcopter Dynamics as Double Integrators

C. Preliminaries of Distributed Control

D. Preliminaries of HITL Control

E. Preliminaries of Formation Control

III. MASCOT: STRUCTURE AND FEATURES

A. Tools Used

- 1) Robot Operating System (ROS):
- 2) Gazebo:
- 3) Falcon Haptic Controller:
- 4) Crazyflie Quadcopter:
- 5) Quadcopter Simulation Package:

B. Control Block

- 1) Heading Control:
- 2) Position Control:

C. Architecture and Features of MASCOT

D. Configuring the Simulation

E. Configuring the Hybrid - Simulation

IV. EXAMPLES

A. Simulation with HITL

- 1) Waypoint Navigation:
- 2) Consensus Algorithms:
- 3) Min-max time Consensus Control:
- 4) Formation Control:

B. Hybrid Simulation with HITL

- 1) Waypoint Navigation:
- 2) Consensus Algorithms:
- 3) Min-max time Consensus Control:
- 4) Formation Control:

V. CONCLUSION AND FUTURE WORK

REFERENCES

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