

A Matlab Toolbox for Calculating an Available Control Authority Index of Multicopters

DU Guang-Xun, QUAN Quan, YANG Binxian, CAI Kai-Yuan

I. INTRODUCTION

This file set is a supporting material for our paper [1]. In this paper, an Available Control Authority Index (ACAI) was introduced to quantify the available control authority of multi-rotor systems. Based on the ACAI, a new necessary and sufficient condition was given based on a positive controllability theory. The calculation procedure of the ACAI is detailed in this file set.

Please use Matlab to run all of the files in the file set. All the M-files have been checked availability on MATLAB R2011b.

II. FILE LIST AND USAGE

1. “acai.m”: A function used for calculating the ACAI.
2. “Multirotor_con.m”: An exemple that uses the function (“acai.m”) to calculate the ACAI is given.

III. NOTICE

Please read the specification in the files to get the further information. If you have any questions, then please feel free to contact Guang-Xun Du (dgx@buaa.edu.cn) or Quan Quan (qq_buaa@buaa.edu.cn). If you use these files or results in your paper, please cite it as: Guang-Xun Du, Quan Quan, “A Matlab Toolbox for Calculating an Available Control Authority Index of Multicopters”, <http://rfly.buaa.edu.cn/resources>, March, 2016.

REFERENCES

- [1] G.-X Du, Q. Quan, B. Yang, K.-Y Cai. Controllability analysis for multirotor helicopter rotor degradation and failure, *Journal of Guidance, Control, and Dynamics*, 2015, 38(5): 978-985.