Masterthesis

Entwicklung einer Methode zur Inferenz von Absichten auf der Grundlage geteilter Kontrolle

Development of an Intention Inference Method Based on Shared Control

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Background

Shared control refers to the method of combining commands of pilots and autonomous systems to take advantage of their intelligence. Typically, in the operation of an unmanned aerial vehicle (UAV), the pilot issues commands through a remote controller that includes two joysticks, creating four controlled variables. So, the pilot needs to control the speed and position of the UAV through these four controlled variables. When the UAV is required to follow a complicated path, the pilot is required to continuously issue accurate control commands to make the flight trajectory conform to the requirements. To improve the smoothness of the trajectory and the effectiveness of the following, an intention inference method is needed to predict and correct the pilot commands.

Task Description

The objective of the thesis is to develop an intention inference method based on the shared control. Firstly, it is necessary to analyze and compare the current advanced method. Subsequently, a intention inference algorithm needs to be proposed. Then, a performance comparison is required between the directly shared control and the shared control with intention inference. Finally, a simulation or experiment should be designed, and the developed algorithm needs to be tested accordingly.

Task List

For this thesis, the following tasks are considered:

- Literature research for intention inference
- Character analysis of the current advanced algorithm
- Development of an intention inference for UAV operation
- Comparison of the proposed method with the other methods
- Testing and evaluation of the method by simulation or field experiment
- Documentation and presentation of results

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Datum

02.03.2022

Darmstadt, den 02.03.2022 Hao Liu

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