

IAA Study Group Status Report

Responsible Commission: 3

Study Number and Title: SG3.32 Autonomous Dynamic Trajectory Optimal Control of Launch Vehicles

Short Study Description (repeat from Study Group Proposal):

Failed launches due to reduced engine thrust have occurred, but advanced guidance and control techniques have the potential to save missions. Dynamic optimization methods are studied for launch vehicle flights. To reduce the risk of mission failure, trajectories and controls are reconstructed online to satisfy the requirements of autonomous flight control under faults and various uncertain conditions. The model-based embedded optimization algorithms are developed, which has abilities for rapid iterations and engineering application. The key is to address the real-time computation and convergence problems of online optimization and control.

Progress in past six months:

- We have confirmed all memberships and been recruiting new members;
- To facilitate the study, we have constructed a homepage of this Study Group at <http://www.iaa-sg332.org/>. We'll soon upload dynamic models as the benchmark of the research as well as related literatures (not later than the end of this years);
- Members of this group, including Chair: Mr. Zhengyu Song, Liu Xinfu, Shao Zhijiang, Theil Stephan, and Wang Cong, had collaborated and drafted a survey of the autonomous guidance method. This paper would be posted on the homepage soon.

Website Study Information update: (please give any update regarding Study Group Membership, documents, Study Plan and Schedule):

No.

Issues requiring resolution? (recommend approach):

No.

Product Deliveries on Schedule? (If modified explain rationale):

No.

Study Team Member Changes? (List any Study Team Members that you wish to discontinue, and provide names plus contact coordinates of any Members you wish to add on the second page of this Study Update form.) Note: Complete contact information including email, tel. and fax must be provided for all additions. Only Members with

complete contact information will be listed and receive formal appointment letters from the IAA Secretariat.)

The secretary of the study group is Mr. Dangjun Zhao, not Danjun Zhao. It was a awkward spelling mistake in our proposal.

Name of person providing Study Group Status (Study Group Chair or Co-Chair):

Zhengyu Song

Status Report Date:

Sep. 21, 2019

Study Team Membership Changes

Effectivity Date:

Discontinue:

Name
Current email address

Add:

Name
Current email address
Tel.
Fax
Mailing address