Module description

Module title					Abbreviation
Trajectory Optimization and Reliability					10-I=TOR-182-m01
Module coordinator				Module offered by	
Institute of Flight System Dynamics, Technical University Munich					
ECTS	ECTS Method of grading		Only after succ. compl. of module(s)		
5	nume	rical grade			
Duration		Module level	Other prerequisites		
1 semester		graduate			
Contents					
Aircraft trajectory optimization belongs to the mathematical field of optimal control. This means that the optimal control history and the optimal state history (and maybe other additional parameters) that minimize a given cost function for a given dynamic system need to be calculated. Thereby, all given initial and final boundary conditions as well as path equality and inequality constraints need to be fulfilled. This enables e.g. the calculation of noise minimal approach and departure trajectories for a given aircraft at a given airport considering the population of distribution as well as any procedural requirements.					
Intended learning outcomes					
In this lecture the students should learn how to solve such optimal control problems beginning with the mode- ling of the required dynamic system as well as the cost and constraint functions. In the next steps on the one si- de theoretical optimality conditions are derived for simple examples and on the other side discretization techni- ques for the solution of realistic problems are introduced. Afterwards, methods for the solution of the resulting sparse parameter optimization problem are presented. Finally, other aspects related to the implementation are introduced.					
Courses (type, number of weekly contact hours, language — if other than German)					
V (2) + Ü (2) Module taught in: English					
Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus)					
written examination (approx. 90 to 120 minutes) Language of assessment: English creditable for bonus					
Allocation of places					
Additional information					
Workload					
150 h					
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Module appears in					
Master's degree (1 major) Satellite Technology (2018)					

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