

Module title		Abbreviation
Trajectory Optimization and Reliability		10-I=TOR-182-mo1
Module coordinator		Module offered by
Institute of Flight System Dynamics, Technical University Munich		Institute of Computer Science
ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	graduate	--
Contents		
<p>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 distribution as well as any procedural requirements.</p>		
Intended learning outcomes		
<p>In this lecture the students should learn how to solve such optimal control problems beginning with the modeling of the required dynamic system as well as the cost and constraint functions. In the next steps on the one side theoretical optimality conditions are derived for simple examples and on the other side discretization techniques 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.</p>		
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		
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Additional information		
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Workload		
150 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Master's degree (1 major) Satellite Technology (2018)		