MSc Systems and Control
MSc Thesis Agreement Form
2023-2024

This form is to be submitted to register the start date and planning of your MSc graduation project (including literature thesis). This should be done **after** you have agreed on the topic and contents of your project with your thesis supervisors and **before or when** starting your literature study.
Please fill in and submit as a PDF file to SC-Coordinator-DCSC@tudelft.nl

1. Do you have at least 54 EC (TUD) / 60 EC (company) and have you finished your obligatory courses? **You need at least 54 EC and you need to have finished your obligatory courses to start your graduation project at TU Delft. If you are doing your project at a company you need to have 60 EC.**

☑ Yes

☐ No **(contact us at sc-coordinator-dcsc@tudelft.nl to discuss your situation).**

2. Are you opting for a short or a long MSc Thesis project?

☐ Short (15 EC electives or JIP + 10 EC literature study + 35 EC MSc Thesis)

☑ Long (10 EC Research Assignment and 5 EC extra electives + 10 EC literature study + 35 EC MSc Thesis)

3. In case of a graduation project at a company: has the TU Delft Graduation Agreement been signed by the Dean, the company and yourself?

☐ Yes

☐ No **(contact us at sc-coordinator-dcsc@tudelft.nl to discuss your situation).**

4. You need to attend 13 midterm/final colloquia by other S&C students before you can graduate. Check the DCSC agenda to find out when the colloquia are taking place. Make sure to sign the attendance list.

☑ I am aware of this

Project Team

MSc-student	Zekai (David) Chen
Daily Supervisor	Mees van Vondelen
Other supervisors	Jan-Willem van Wingerden
(working) title of MSc thesis project	LiDAR-enhanced Closed-loop Active Wake Mixing Control

Planning of the Project:

Starting Date	05/03/2024
Planned Date of Midterm Colloquium	01/07/2024
Date of the go-ahead meeting	01/02/2025
Planned Month of Final Examination	01/03/2025
Special arrangements MSc project work	
Additional agreements (progress reports, supervisory committee meeting)	

Other Issues (if Applicable)

List of required facilities (like laboratory equipment)	
Budgeting (if extra expenses are expected)	

Content/scope/deliverables (**optional**)

Content This thesis aims to explore the application of a nacelle-mounted downwind facing LIDAR in the application of an active wake-mixing wind farm control strategy. The final goal is to develop a closed-loop control strategy for the helix approach at a single turbine level. It is anticipated that this control strategy will effectively adjust the helical wake of the upstream turbine. Additionally, simplify the data acquisition process for phase synchronization or multi-turbine wake mixing control.
Scope This thesis will cover the research in the following fields: Active wake mixing, wake modeling and feature extraction, closed-loop wind farm control, and data-driven control.
Deliverables The final deliverable of this thesis should be a written report, a newly proposed algorithm, and the corresponding simulation results that validate the design. In the report, the author should analyze the application of LIDAR in wind farm flow control, explain the design of the new control system including the framework and the detailed description of the sub-systems, and finally provide simulation results of this proposed algorithm under different fidelities for design validation.

Signatures

Jan-Willem van Wingerden

Digitally signed by Jan-Willem van Wingerden
Date: 2024.05.06 13:16:00 +02'00'

MSc student | MSc Thesis Supervisor | MSc coordinator

01/11/2023/MVR