

# KINEMATICS ANALYSIS AND OPTIMISATION OF DRIVES



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**BACHELOR THESIS**



**MASTER THESIS**



**ADP**



**AERO SPACE ENG.**



**MECH. ENG.**

- Sustainable Use of Resources
- Clean Energy and Process Engineering
- Future Automotive Systems
- Digital Based Production and Robotics



## Motivation

At VIAME, we are developing new concepts for lightweight design in several sectors (transportation, energy, machining,...). This research project will focus on detailed analysis drives and their influential design and operating parameters. Various optimisation strategies, including tooth profile modifications and bearing conceptions, should be comprehensively evaluation together with developed lightweight concept. To this end, detailed FEM and dynamic modelling will be achieved. The complexity of modelling will lead to a metamodeling stage, in order to deal with different uncertainty sources. The final goal will be on the minimization of cycloid drive mass and backlash effects while maximizing the transmission efficiency and precision. The thesis will be performed remotely at Ecole Central de Lyon, France.

## Tasks

- Kinematic and parametric study of cycloid drives
- Assessment of the optimisation solutions regarding flexible cycloid disc, tooth profile and ring rollers
- Experimental investigation of optimisation impact on the overall cycloid drive behaviour

## Desirable

- Experience in FEM simulation
- Background in composite materials modeling

## Start

September 2025



**CENTRALE  
LYON**

