Optimal design of a rocket nozzle actuator

Component
École Nationale Supérieure d'Électrotechnique d'Électronique d'Informatique d'Hydraulique et des Télécommunications

In brief

- **Ametys Code:** N8EE21B
- **Open to exchange students:** Yes

Presentation

Objectives

The design office "Optimal design of a rocket nozzle actuator" aims to introduce students to the use of optimization algorithms, in particular gradient descent, to design electrical machines efficiently.

Description

Students will learn to formulate machine design problems in terms of mathematical objectives and constraints, then apply numerical methods to optimize performance, such as efficiency, compactness, and energy losses. Emphasis will be placed on understanding and implementing different types of gradient descent, including stochastic and adaptive versions, adapted to electromagnetic systems. Students will use simulation tools to test and validate their optimal solutions in real-world machine design scenarios. Finally, through case studies and practical projects, they will develop skills in applying optimization algorithms to complex industrial problems, strengthening their ability to design high-performance and economically viable electrical machines.