Master thesis

Preliminary Sizing of a Pylon for a Long-range Aircraft with Over-the-wing engines

The need for sustainable and energy-efficient air transport pushes the aviation industries toward the design of the next-generation aircraft, with dramatic energy consumption, emission, and noise. The Cluster of Excellence SE$^3$A – Sustainable and Energy Efficient Aviation is an interdisciplinary research center investigating technologies for a sustainable and energy-efficient air transport systems. Scientists from fields of engineering, economics, and chemistry are working on the reduction of drag, emissions, and noise, life-cycle concepts for airframes, improvements in air traffic management, and new technologies for energy storage and conversion. The overall project is structured into three core research areas: “Assessment of the Air Transport System”, “Flight Physics and Vehicle Systems”, and “Energy Storage and Conversion”.

Present Master’s thesis project focuses on a preliminary sizing of a pylon for the next-generation long-range commercial jet with over-the wing engine allocation and a capability of embedding the landing gear.

**Project Details:**
- Project duration: 6 Months
- Project start date: November-December 2022

**Work Plan:**
- Preliminary sizing of the landing gear of the long-range aircraft and sizing of the pylon to embed it
- Initial low-fidelity aerodynamic assessment of the pylon and estimation of pylon loads
- Preliminary structural sizing of the pylon configuration, estimation of the pylon’s weight
- Conclusion regarding effects of the configuration on the weight and drag penalty

**Requirements:**
- Pursuing a Master’s degree in Mechanical/Aerospace engineering
- Experience in structural and aerodynamic analysis and design using classical textbook methods
- Solid programming skills in one of languages: Python, MATLAB
- Ability to work independently
- Fluency in written and speaking English

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