Development of an audio assessment module for sound engineering of aircraft designs

Aircraft Noise and Climate Effects (ANCE)

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Project Overview

Sound engineering is an approach widely applied in the automotive industry to optimize the sound of cars whilst retaining core performance. Cars are not just more efficient nowadays but have much improved sounds compared to their older versions. The focus for aircraft has till now been to make them 'quieter'. Aircraft noise however still contains adverse components such as audible tones and rapid intensity fluctuations leading to a rough unpleasant sound. To capture these effects, various sound quality metrics exist that can accurately model the loudness, tonal and roughness characteristics. These metrics are to be implemented as part of an aircraft noise Audio Assessment Module (AAM) with the future goal of integration in an aircraft design chain, for aircraft design for optimal sound.



Project Goals

Implementation of an Audio Assessment Module:

- Literature research on suitable metrics and approach for sound engineering of aircraft designs
- Selection of suitable metrics and implementation using digital signal processing techniques
- Validation of metrics with publically available data and commercially available software such as PULSE of B&K
- Application to measured sounds of current and older aircraft to quantify changes in sound quality

Student profile: - Good knowledge in/affinity for acoustics, digital signal processing applied to aircraft noise

Good programming skills (Matlab), highly motivated



MSc Research Thesis Assignment