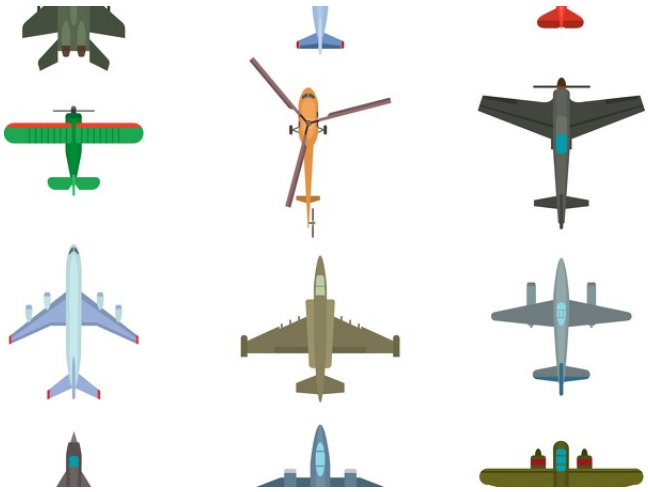
INNOVATION PARTNERSHIPS
UNIVERSITY OF MICHIGAN

IDEAS Lab Historical Aircraft Database

TECHNOLOGY NUMBER: 2024-320



OVERVIEW

A comprehensive database capturing historic aircraft and engine design characteristics

- Enhances design accuracy and efficiency by streamlining access to detailed performance data
- Supports rapid conceptual design for both conventional and electrified aircraft

BACKGROUND

In the field of aircraft and aerospace engineering, the conceptual design phase relies heavily on access to accurate historical data for benchmarking and validating new concepts. Traditionally, data on aircraft and gas turbine engines was dispersed across technical papers, outdated reports, and various independent databases, leading to inefficiencies and inconsistent parameter selection. Early approaches to compiling aircraft data often suffered from incomplete records, lack of standardization, and limited accessibility, creating barriers for researchers and engineers. As interest grows in electrified aviation technologies and advanced powertrain configurations, the need for a unified and comprehensive historical database has become evident. Such a resource would enable faster design space exploration, facilitate technology comparisons, and improve the credibility of screening new concepts, thereby supporting innovation in both traditional and next-generation aircraft development.

INNOVATION

Technology ID

2024-320

Category

Software

MOSS - Michigan Open Source Support

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The IDEAS Lab's historical database, created under the NASA electrified powertrain flight demonstrators project, revolutionizes early-stage aircraft design by consolidating technical specifications for hundreds of aircraft and gas turbine engines into a single, standardized Excel resource. By systematically cataloging weights, geometries, speeds, and performance metrics, the database enables rapid and reliable comparison of existing technologies, which is especially valuable for electrified aircraft powertrain studies. Integrated into the aircraft design tool developed by the same lab, the database facilitates efficient design space exploration and parametric analyses. This advancement greatly accelerates conceptual modeling for both conventional and emerging electric aircraft, reduces the risk of oversight or error, and fosters data-driven decision making. Real world applications include early-stage aircraft concept evaluation, electrified propulsion feasibility studies, and technology benchmarking for industry and research institutions.

ADDITIONAL INFORMATION

PROJECT LINKS:

DEPARTMENT/LAB:

- Gökçin Çınar, Aerospace Engineering

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