ASCENT Project 54

AEDT Evaluation and Development Support

Georgia Institute of Technology

PI: Dimitri Mavris, Michelle Kirby

PM: Joseph DiPardo, Mohammed Majeed

Cost Share Partner: Delta Air Lines

Objective:
- Use of real-world data in the form of Flight Operational Quality Assurance (FOQA) or Automatic Dependent Surveillance Broadcast (ADS-B) to validate aircraft performance model in AEDT
- Development of data-analytic methods such as clustering and feature extraction to continue to improve departure, arrival, and full-flight operation modeling capabilities within AEDT
- Conduct system evaluation of AEDT features for verification and validation

Project Benefits:
- The main benefit of this research is to address the gaps in AEDT related to departure profiles that are outdated and arrival procedures that might not reflect current airport operations.
- Improvement to AEDT's environmental impact assessment, i.e., the accuracy of noise, fuel burn, emissions and air quality impacts.

Research Approach:
- Perform comparisons between thousands of real-world flights against the outputs of AEDT's performance models for arrival, departure, and enroute phases to obtain statistics about the overall agreement with existing AEDT definitions
- Model noise abatement departure procedures (NADP) in AEDT and compare against real-world data to quantify differences
- Evaluate arrival operations in terms of their level-off parameters (height, distance, change in speed) and quantify the effect of these parameters on fuel-burn, and emissions
- Develop and provide a method for the environmental impact assessment of full-flight (runway-to-runway) operations, complementing the current sensor path method
- Perform system testing and evaluation of AEDT features to identify discrepancies, quantify differences, and document possible improvements for future efforts

Major Accomplishments (to date):
- Compared AEDT profiles with real-world operations for arrival and departure procedures and identified key differences
- Developed a method for full flight comparison model of AEDT against actual airline data.
- Performed system testing on various AEDT features and supported AEDT 3e release

Future Work / Schedule:
- Analysis of clustering effort on level-off data to identify representative arrival operations
- Complete comparison of full-flight modeling in AEDT with real-world flight operations
- Continued system testing support for the on-going development of AEDT