

Contrail Avoidance Decision Support and Evaluation

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Research Approach:

- Develop **software modules** as follows:
 - **Contrail forecasting** to predict contrail-forming conditions prior to and during flight
 - Real-time **contrail identification** in satellite images based on existing deep learning approaches
 - **Contrail radiative forcing** estimation based on recent work at MIT
 - **Trajectory planning** to forecast fuel burn and emissions for a spectrum of flight paths

Future work

- Combine into a **cost-benefit evaluation** tool designed for use on a flight-by-flight basis
- Develop and run **tests** for the tool

Objective:

- Develop a **decision support tool** for optimal aircraft routing to avoid formation of warming contrails by evaluating the **likely costs and benefits** of a contrail avoidance action.
- Evaluate the decision support tool under real-world conditions.

Project Benefits:

- **Rapid evaluation** of contrail formation and impacts for different strategies
- Demonstration of **practicality of contrail avoidance** to relevant stakeholders
- Directly advance **sustainable aviation**

Major Accomplishments (to date):

- Project beginning imminently

Future Work / Schedule:

- Contrail forecasting and identification modules: *Spring 2022*
- Radiation module: *Summer 2022*
- Trajectory optimization module: *Fall 2022*