

Title:

Air Transportation, Convective Weather, and Multicriteria Optimization

Abstract:

Convective weather, along with the hail, thunderstorms, tornadoes, and turbulence associated with it, pose a threat to the safe and efficient operation of the air transportation system. This presentation will describe ongoing research investigating the impacts of such weather on the system, and developing decision support tools for pilots and air traffic controllers based on multicriteria optimization. First, the results of a study examining flown aircraft trajectories in the airspace around Atlanta during 40 days in the Spring and Summer of 2007 will be presented. Next, an aircraft route guidance problem with objectives for risk and efficiency will be identified. Relatively speedy techniques for solving the identified biobjective problem to optimality will be presented. A brief discussion of the motivation for, as well as the setup and solution of, multicriteria air traffic flow management problems will follow. Often overlooked objectives of such a problem include minimizing inequity, risk, and environmental impacts. This presentation will serve as an introduction to a number of ongoing research projects, and an invitation for collaboration.