Problem: How many slots should exist in different time periods at an airport?

Background:
- A slot grants authority to schedule a landing or takeoff
- Few US (but most European) airports are slot-controlled
- In practice, slot profiles over a day are generally uniform

Motivation:
- Not necessary to assume a uniform slot profile
- Should not use good or bad weather capacity exclusively
- Balance level of service (delays/cancellations) against number of slots
- Certain time periods are naturally more valuable than others
- Create recovery periods after high utilization periods

Mathematical Formulation:
- Integer linear program (almost a network flow model)
- Stochastic optimization over a set of discrete capacity scenarios
- Maximize total value of slots
- Specify expected level of service

Results:
- Case study using data for New York’s LaGuardia Airport
- High-valued periods have more slots
- Model meets level of service targets (10/15 mins delay, 2%/3% cancellation rate)
- Forcing uniform profile reduces objective function 3–5%