

The Summer Undergraduate Research Fellowship (SURF) Symposium  
4 August 2016  
Purdue University, West Lafayette, Indiana, USA

## Development of Functional Requirements

\*Noel Colon, \*\*Steven J. Landry, \*\*\*Jeonjoong Boo

\*University of Puerto Rico, Senior, Department of Mechanical Engineering, noel.colon2@upr.edu

\*\*Associate Head and Associate Professor of Industrial Engineering and Associate Professor of Aeronautics and Astronautics (by courtesy), slandry@purdue.edu

\*\*\*School of Industrial Engineering, PhD. Student, jboo@purdue.edu  
Purdue University, 315 N. Grant St., West Lafayette, IN, USA

### ABSTRACT

NASA along with other researchers visualizes a future where more aircraft will transport passengers or goods around the world. Thus, they envision increasing air capacity from 10 to 100 times more than the current system without any reduction in efficiency or safety. Many models are being proposed that comply with the necessary requirements to form part of the method needed. However, knowing which of the proposed methods have the most desirable characteristics, such as efficiency and safety, are yet to be determined. For this reason, a standardized method to compare and assess them has to be developed, since is not possible to apply them all. An approach to this issue is establishing functional requirements, which are a set of standards that assess and compare performances of new models. Thus, this research is focused on identifying quality measures, which are measures of the requirements, in order to establish functional requirements. As for the first step, measures regarding air transportation system were collected and analyzed by literature review and surveys to determine the potential candidates. As a result, the final potential quality measure candidates were obtained that lead us to determine the ideal measures of the functional requirements and three types of quality measures were discovered. These measures of the functional requirements will constitute a standard to assess new models being proposed and determine the most desirable results.

### KEYWORDS

Air Transportation System, State-Based Models, Air Capacity, Quality Measures