



University of Limerick  
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## **Development of an aircraft performance model for the prediction of trip fuel and trip time for a generic twin engine jet transport aircraft**

*Diplomarbeit* in compliance with § 21 of "Ordnung der staatlichen Zwischen- und Diplomprüfung in den Studiengängen Fahrzeugbau und Flugzeugbau an der Fachhochschule Hamburg"

### **Background**

Performance data acquired by flight testing is used by aircraft manufacturers to produce a Performance Engineers Manual (PEM). The PEM contains the basic airplane aerodynamic and engine performance data in graphical and tabular form and may subsequently be used to calculate critical performance parameters, such as climb rate, take-off distance and range.

### **Task**

Starting with the PEM tables for a generic twin engine jet transport aircraft, a user friendly, aircraft performance model is to be generated. A spreadsheet using macros and lookup tables (containing all relevant aerodynamic and engine performance data) is to be developed that will facilitate the user to compute the trip fuel (and hence the brake-release weight) and the trip time for a user specified range. Standard ICAO International flight reserves are to be used for the baseline calculations. It shall also be possible to calculate the range for a given payload, fuel quantity and brake-release weight. The model shall be flexible and shall facilitate the user to study the impact on the fuel burn due to changes in en-route drag, for example.

The results have to be documented in a report. The report has to be written in a form up to internationally excepted scientific standards. The application of the German DIN standards is one excepted method to achieve the required scientific format.