Air traffic simulator
(Project deliverables PD5 and PD6)

Presentation

Your team will be in charge of developing an Air Traffic Simulator that takes a list of flight plans and counts the number of aircraft at each sector in a given FIR/UIR as a function of the time. This tool will also implement a CASA algorithm able to assign delays to flights when the forecast demand exceeds the capacity at a given sector or airport.

Two versions of the Air Traffic Simulator must be delivered:

Version 1 (deliverable PD5)

This version will implement a complete set of functions (simulation and traffic regulation) but with a single sector in the FIR/UIR. In particular, version 1 will implement:

- Visual simulation of flight plans through airspace (both step-by-step and automatic modes of simulation), including loading/saving of flight plans from/into text files.
- Management of databases with waypoints and companies information.
- Graphic tool to define flight plans.
- Non visual simulation of flight plans and sector congestion, plotting the congestion level.
- Traffic regulation using CASA algorithm.

Version 2 (deliverable PD6)

This version will implement the same set of functions as version 1 but will work with several sectors in the FIR/UIR. Moreover, version 2 must include additional functionalities defined by the team to make the tool as useful as possible.

Assessment

The Air Traffic Simulator tool will be assessed according to the following criteria:

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Description</th>
<th>Weight in version 1</th>
<th>Weight in version 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complete</td>
<td>Implements all the requirements</td>
<td>50%</td>
<td>45%</td>
</tr>
<tr>
<td>Robust</td>
<td>The tool never hangs, even if user inputs wrong data</td>
<td>15%</td>
<td>7.5%</td>
</tr>
<tr>
<td>User friendly</td>
<td>User never doubts on how to interact with the tool</td>
<td>10%</td>
<td>7.5%</td>
</tr>
<tr>
<td>Efficient</td>
<td>The best algorithms are used always</td>
<td>10%</td>
<td>5%</td>
</tr>
<tr>
<td>Well organized and documented</td>
<td>Good organization of code into classes and forms. Enough comments in every block of code. Good use of indentation.</td>
<td>15%</td>
<td>10%</td>
</tr>
<tr>
<td>Additional functionalities</td>
<td>Additional functionalities are not trivial and make the tool really interesting and useful</td>
<td></td>
<td>25%</td>
</tr>
</tbody>
</table>
Some images of expected result

These are some images from the Air Traffic Simulator developed by Marc Sales, Aitor Ridaura, Sergio Vives and Nil Sala during semester 2011-2012Q2. These images may help you to understand better the requirements of the project.

A software tool with several options

Visual step-by-step and automatic simulation of flight plans

Plotting sector congestion level to apply CASA regulation algorithm

Easy consultation of aircraft companies database