Master Thesis assignment

Aircraft noise in a virtual street

Keywords: 3D, Google street view, augmented reality, Aircraft Noise, Virtual reality, GIS.

The Dutch National Aerospace Laboratory (NLR) is the research and development institute for aerospace in the Netherlands and has a well-known reputation on aircraft design and operations in the Netherlands and abroad. The environmental department (ATEP) of the NLR performs research related to aircraft noise, aircraft pollution and safety for areas around airports.

A major topic of this department is to investigate and minimise aircraft noise annoyance in the vicinity of airports. NLR utilizes the Virtual Community Noise Simulator (VCNS) to research the factors that annoy people with aircraft noise. In the VCNS, an observer can experience an actual flyover of an aircraft in a virtual environment. By using this simulator, different aircraft and procedures can be experienced by the same observer. This allows flyover noise in a controlled environment, which is an innovative and unique capability.

To improve the use of this facility, the visual capabilities of the VCNS must be extended so it can be targeted for a number of representative environments for the user. Ideally, any (geographic) location in the Netherlands could be a candidate for aircraft noise research.
Your task will be to examine the different geographical data available on its feasibility for application in a demonstrator-setup of the VCNS. The VCNS can then be positioned on a certain point in the Netherlands (e.g. a street), where overflying traffic can be observed.

Tasks include:
- Investigation of the needs for the VCNS in the ATEP department, including Augmented Reality (AR) possibilities.
- Examination of current sources for geographic data, like Google Earth and Google Street View.
- Examine how flying 3D virtual objects from the VCNS can be projected into a view containing real images.
- Examine the possibilities to include the visualisation of moving objects on the ground in the virtual environment (cars, bikes, trains etc).
- Develop means to include geographical data in the VCNS.
- Provide a VCNS demonstration setup to show the concept.

Your qualifications:
- Computer science education (HBO/University), final year.
- Experience or interest for geographical information systems (GIS) and 3D projection.
- Experience with online APIs and web technology.
- Interest in the area of aerospace and simulation.
- Practical, “gettings things done” mentality.

The assignment will be performed at the NLR, Amsterdam. When sufficient results become available, a publication of a paper in cooperation with an NLR expert could be achieved for presenting in an international experts forum.

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