3D stereoscopic visualization in augmented reality for airborne surveillance operators

University of South Australia

Name of the hosting institution in France
Name of the host laboratory / research team
Address
Web site
Name of the supervisor
Function
Email
Phone number

Internship offer

Topic of the internship (title)
Proposed dates of the internship
Start: 2020-03-02
End: 2020-09-01

Scientific and academic objectives of the internship (detailed description of the internship content, work expected from the intern and expected outcomes):

In the context of their joint research laboratory ATOL, Thales DMS France and IMT Atlantique are studying a new capacity for observers in surveillance aircrafts. These operators must keep their eyes on what is going on outside of the aircraft through dedicated windows. For example, the French maritime surveillance aircrafts have been specially equipped on both sides with observation windows that allow two operators, one on each side, to have an important field of view outside the aircraft, in order for example to search for a wrecked sailing boat, a person overboard, or to spot a voluntary pollution. The new capacity consists in providing the operator with contextual information about the observed object directly on the window, in real-time, so that the operator does not have to take his eyes off the object of interest with the risk to lose it. This can be achieved by coupling two innovative techniques:

1. Tracking the operator’s gaze with an eye-tracking solution to infer the observed geographical point. With the gaze direction tracked relatively to the observation window, the position of the observed point can be inferred using triangulation, thanks to the movement of the aircraft whose speed allows calculating the observed position in near real-time.

2. Displaying contextual information about the observed point or object using Augmented Reality (AR), on the window itself, as is done on the windscreen of cars for example, this information being computed through a correlation of the observed position with data that is acquired by the sensors embarked in the aircraft, such as a RADAR or an AIS receiver. The AR solution foreseen is based on a semi-transparent holographic screen in front of the aircraft window coupled to a short-throw projector. Here, the work would consist in studying and prototyping an additional stereoscopic 3D capacity for the AR display, so that the operator could see the contextual information displayed in AR directly in the plane of the observed object rather than in the plane of the observation window, facilitating the visual association between the object and the related information.

Name of industrial partner
Role of the industrial partner in the internship project

Main contact at the French industrial partner
Name of the French partner institution
Name of lab/department/team involved in the collaboration at the French partner institution
Main contact in the French partner institution
Function of the main contact in the French partner institution
Email address of the main contact in the Australian partner institution

Expected profile of applicant

Level of study
Discipline
Required qualities, knowledge and skills
Other specific eligibility criteria

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