

Assistant Systems for Use in Air Vehicle Inspection and Maintenance Tasks

Dr.-Ing. Dieter Langer
EADS Customer Support Operations

Abstract :

A customer expects decreasing costs for future product support services at equal or even better quality than today. This challenge of the future can be fulfilled by the introduction of a new technology assisting technicians or mechanics who perform service work.

A scenario will be presented, which shows an assistance system that is used during maintenance level 1 or depot level skin inspections of the NH 90 helicopter, which is made to a high degree of CFK material. This system exactly overlays structural information, which is generated from rendered CAD images, onto the surface of the helicopter. Thus, a technician can easily judge if a visible deformation is, in fact, a severe or rather a cosmetic damage. The system displays on request previous defects in the neighbourhood of the actual damage, which might have an impact on the selection of the final repair scheme. Similarly, the new defect is stored in the air vehicle's record for future use. In case that the experience of the mechanic is exhausted, a secure, remote connection can be established to consult with a specialist.

Finally, it is shown that an efficient management of information can cope with challenges of the future.

1 Description

In this presentation an assistant system will be shown which is used at EADS as a technology demonstrator.

The system consists of a fully wearable system with a head-mounted camera and data goggles and a wearable computer which is attached close to the neck of a user.

The software of the system is developed within the ARVIKA consortium. It supports:

- hands-free operation by the use of a speech interface,
- mouse-less operation as a backup mode by means of a rotary click button,
- PDA-type devices as an alternative to data goggles, which operate as client terminals.

The software provides:

- marker tracking capability,
- connections to remote experts,
- flexible allocation of computing resources in a client-server environment.

The assistant system is used in a maintenance scenario which is shown in the attached figure:

At maintenance level 1 or 2 (at depot level) the skin of a helicopter is inspected for visible defects. If defects are detected, the system exactly overlays rendered 3 dimensional construction images onto the helicopter's surface, which enables the mechanic to exactly judge the severity of the damage or defect. In case that the mechanic cannot identify which repair measure should be un-

dertaken, he can establish a secure, long distance connection to a remote expert who provides competent assessment of the damage. Consequently, the proper corrective action can be followed and, finally, documented in the air vehicle's record.

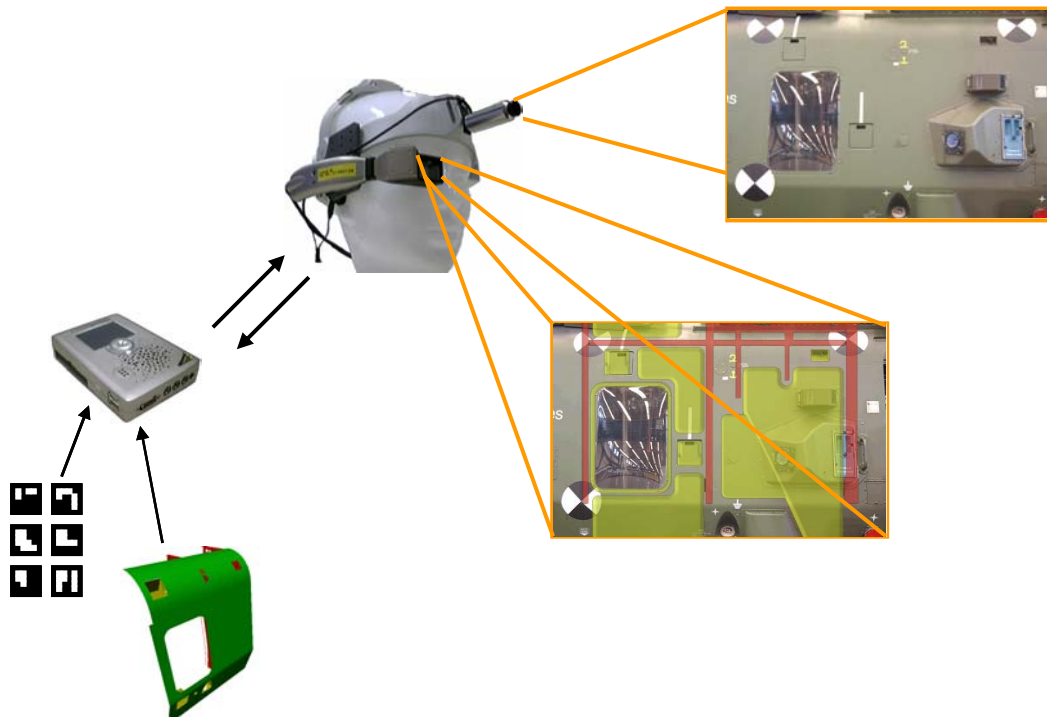


Figure 1: Illustration of Augmented Reality Technology