HMI and Decision Support

Human-Machine Interaction (HMI) and decision support is important to air systems, with several applications for pilots in airplanes/helicopters as well as remotely operated aircraft, command and control systems, maintenance systems, training and evaluation and more. It is often important decisions that have to be made by an operator and sometimes it has to be fast decisions even if they may be difficult and complex in nature. Therefore, it is important to ensure that the technical systems together with potential users will be able to copy with every possible future situation that may occur, already when developing new air systems.

In the case of an aircraft it may be to provide the pilot with the right information at the right time and to present it in a usable way. It is most important to achieve the highest flight safety, but also HMI and decision support aim at increasing the total system performance, including both technical systems and human activities. Sometimes a decision loop metaphor is used to describe the cycle of observing, orienting, deciding and acting which in turn influences the observing and so on. Some decisions are made by the technical system without involving a user whilst other decisions include human interaction.

There is a current technical trend ongoing to enable more decisions to be made without involving a user or with limited user involvement. One example is challenges for future unmanned air systems and another is advanced decision support for operative aircraft maintenance. However, there are research challenges that the cluster approaches to develop future air systems that best explore these options to create useful systems. The cluster includes multi-disciplinary research including collaboration between human and autonomous systems at various levels.

The cluster has active contacts with several other clusters, especially the cluster for cooperating systems and the cluster for operation and maintenance.