Shared and cooperative control of situations is now a term used in the context of humans and machines, but affects homo-sapiens already much longer than human-machine systems exist. Anthropologists describe not only how the human cognition evolved, but how the ability to have a shared intentionality, to cooperate towards common goals and to integrate tools and technology into this interplay shaped homo-sapiens and enabled his rise to one of the most dominant species on this planet. Many thousands of years later, the interplay between humans and technology has become even more important. Machines have become more capable not only to extend our physical power, but also to develop cognitive capabilities and to act automatically. Automation is already prevailing e.g. in aviation, but also in other domains like ground vehicles, cognitive capabilities of machines are increasingly used e.g. in form of assistance systems or automated driving. While assistance points towards a role of the machine that is only trying to support the human, and automation points towards a solution where mainly the machine is taking over the main task, there are situations where both the human and the machine act together at the same time. This has been described so far with at least two different phrases that have so many aspects in common that they should be analysed and developed together. One phrase is Shared Control that stresses the fact that human and machine share tasks and control a situation together. The other phrase is cooperative control or cooperative automation, that stresses the fact that human and machines cooperate on a task and control a situation cooperatively. Shared and cooperative control must not be seen as different concepts, but as slightly different perspectives or foci on a common design space of shared intentionality, control and cooperation between humans and machines. One working hypothesis which the special issue will explore is that shared control can be understood as cooperation on the control level, while cooperative control can include shared control, but also extend the cooperation towards higher levels e.g. of guidance and navigation, of manoeuvres and goals (see. Figure 1).

Figure 1. Proposed relationship between shared control, shared and cooperative guidance and control, and human-machine cooperation
In this special issue the common framework of cooperative and shared control sketched above will be elaborated. A couple of examples of shared and cooperative control from the aviation, automotive and robotics domain will be discussed. The special issue will integrate technical papers as well as human factors oriented papers. The following application domains are of special interest: aviation, automotive, UAV and tele-robotics. Furthermore, it is desirable that contributions relate to at least one of the following keywords: shared control; co-operative control; robotics; human-robot interaction; human-robot collaboration; guidance; ecological interface design; cognitive engineering; human factors; HMI; hierarchical control; dynamic task allocation

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