We need to improve interaction and collaboration in immersive virtual environments. Indeed, frameworks for the design of immersive and collaborative virtual environments are now mature enough to allow researchers to focus on higher-level description of immersion and collaboration rather than on low-level system features. However, we still have to improve both the immersion of the users and the ability of distant users to collaborate efficiently when they are sharing a virtual environment, by proposing new metaphors for immersive 3D collaborative interactions.

To meet these requirements, we need to be able to adapt VR software to various kinds of immersive hardware devices while we need also to embed a symbolic representation of these devices into the virtual environment in order to make users aware of the limitations of these devices at run-time. For example, embedding in the VE a 3D model of the bounds of the displays devices may prevent users to collide with these devices, if the VR system can rely on an adequate metaphor to make the user aware of the danger. In the same way, when distant users are collaborating in a shared virtual environment, they need interaction metaphors that are adapted to collaboration and also able to make them aware of the actions of the distant users as well as of their limitations. 3DUI contests in 2012 (3DUI for collaborative navigation) and 2016 (3DUI for collaborative manipulation) are typical examples showing that 3D Collaborative Virtual Environments are more in evidence than ever.

So, these new trends of immersive and collaborative interaction techniques are raising new issues for design, implementation and evaluation of Immersive Collaborative Virtual Environments, especially regarding interaction and coordination for achieving collaborative tasks.