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#### GATEWAY4U – REMOTE VIRTUAL COLLABORATIVE ENVIRONMENT FOR DESIGN EVALUATION

TAS in Italy Concurrent System Modelling (CSM) - VR Team in the frame of LOP-G Habitat proposal, developed a new tool namely GATEWAY4U (based on Unreal Engine software) to share in virtual “remote” collaborative environment the CIS LUNAR module architecture layout and functional allocation issues since the early design development review phases. The 3D tool test sessions activities performed in collaboration with ESA EAC VR team, started in January 2019 thanks to the astronaut Samantha Cristoforetti feedbacks received during the first LOP G design brainstorming performed in TASI in December 2018. In this occasion the habitability requirements guidelines and user needs were discussed and it was remarked “the great potential advantage of the virtual reality to simulate in an effective way the sense of presence in microgravity; you can move yourself, translate yourself from an area to another one, “feel geometric constraints, simulating the ability to move in the environment by pushing off handrails”. Based on the GATEWAY4U testing sessions user's feedback results, the 3D tool has been upgraded including the entire body of the avatar in the VR scene to improve the sense of presence of the user when interacting inside the 3D immersive scenario. The GATEWAY4U was validated the 20th of May with the participation of the ESA astronaut Matthias Maurer who successfully tested the avatar usability in 0g microgravity simulation for the design's compliance to human factors requirements.

TASF VR team joined us in June '19 sharing the GATEWAY4U utilization together with ESA EAC for the design review session in remote connection performed with Samantha Cristoforetti in July '19. The sharing knowledge between TAS in Italia and TAS Cannes teams is under way to contribute to resolve standardization issues and demonstrate how to be more effective in problem solving with time and cost reduction using virtual reality.

GATEWAY4U provide to the international community a “new way of working“ deeply in line with the worldwide “digital transformation” trend. The acquired lesson learnt will guide the future 3D tools evolution which need constant synergies between agencies, engineering teams and final users (astronauts) to build 3D tools more flexible and affordable, easy to use to improve people creativity and reduce time to market.

The GATEWAY4U took advantage by previous VR design activities held in the frame of ISS Operation Program in developing a TASI digital platform COLUMBUS4U that was delivered to ESA in April 2017 for crew maintenance support on ISS Columbus module. This is also a significant example of the User Experience (UX) application to collect ISS acquired lesson learnt to contribute for the evolution of the future Thales products and processes to build the future customer-driven product-service design in a global environments.