VR for RTC

The possibility to control the airport through VR

The latest airport built in Sweden, Scandinavian Mountains Airport, is built without a physical tower and relays completely on the remote tower(RTC) infrastructure, the remote control is now the standard. Although the remote towers are very cost effective and centralizes the operators to one location each airport still needs its own physical control booth to be operated. We investigate and evaluate the use of Virtual Reality(VR) for supervision and in the future operation of the remote tower so that the physical setup can be complemented with a virtual setup and give the extension to working remotely from a completely different site.

Figure 1 VR visualizations from the remote tower control center at Sundsvall airport in Sweden

The pipeline

The pipeline consists of three main components: scene digitization, collecting the data stream from the remote tower, and VR visualization. In a first step, a coarse 3D model of the scene is built using photogrammetry or time of flight laser scanning, LIDAR. The purpose of the 3D model, or point cloud is to give the supervisor a feeling of being present in the remote tower location. All the screens in the VR environment are digital twins with the real screens and updated using the webRTC framework, all video information form the remote tower cameras, radar screens and E-strip are updated synchronized in both places. In this setup the supervisor can only see the information and not interact with the system. The system allows the supervisor to virtually move between different airport just by changing the source of the video stream and it also allows for multiple supervisors to use the same tower or for training purposes. The system allows for multiple towers in the same VR environment by splitting up the screens between the different remote towers.

Case study

As a case study, the project scanned and created VR visualizations from the remote tower control center at Sundsvall airport in Sweden, see Figure 1. The initial experiments and the ongoing evaluations have shown that VR indeed has a very strong potential to be used as a tool for RTC supervisors. We also see the potential of a new type of collaborative environment for training air traffic controllers and knowledge exchange between supervisors.

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