3D assistance in shipbuilding

Objective: 5G and the processing power of Edge Computing enable AR visualisation of the next steps in ship construction, as well as monitoring the accuracy of what has already been built, through 3D scans.
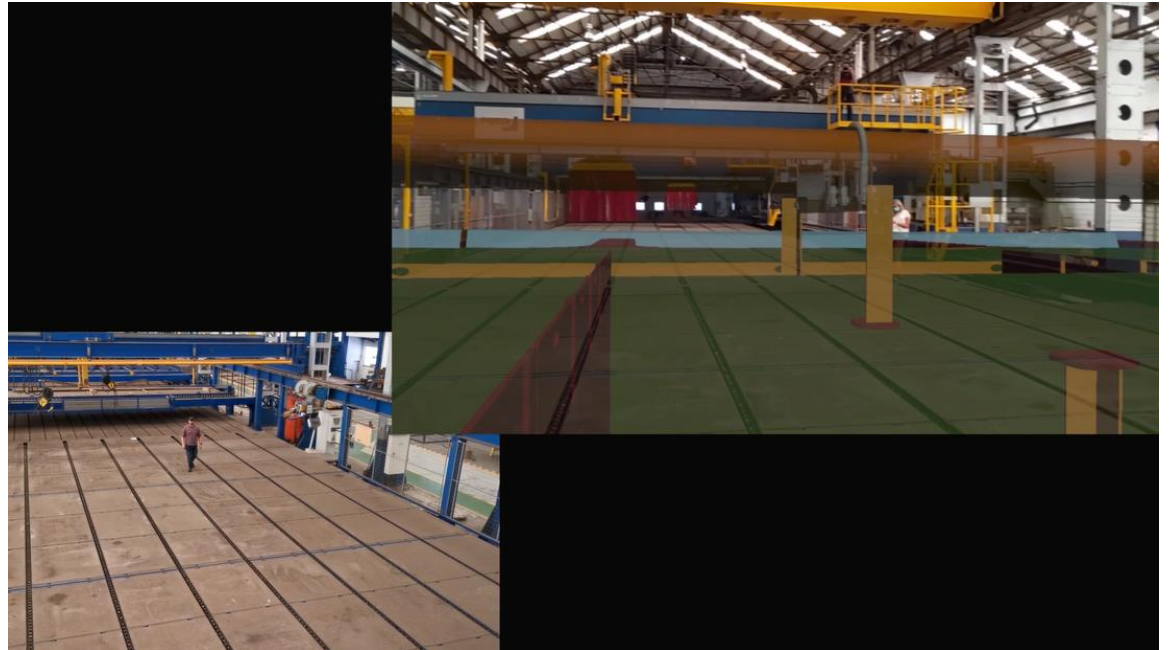
Description:

Deployment of 5G coverage at the Navantia shipyard in Ferrol in the 3.5GHz and 26GHz frequencies and development of Edge Computing applications to support **3 different use cases**:

1.-Remote technical assistance through AR and 3D models for diagnosis and support: The machinery and devices used in an assembly line and industrial processes are very complex, which entails a very specialised support that few people or applications are able to provide. The direct consequence is that every time an important part breaks down, it is necessary to wait for a specialist from the supplier company to come in person, which can take days, with the consequent loss of productivity in the assembly line. To avoid this situation, this use case will enable, through augmented reality techniques, a local non-specialised operator to carry out repair or maintenance tasks with the assistance of a remote specialist, reducing the downtime of the industrial chain.

2.-Accurate visualisation in AR of virtual parts in a real environment: Going further in augmented reality scenarios, Telefónica will seek a solution to situations where we want to verify, in a real scenario, how a part we have designed will look before proceeding to manufacture it. It will be possible, for example, to verify that a pipe will fit perfectly in an already built cabin of a ship, before proceeding to its manufacture.

This use case requires the placement, in an augmented reality image, of a part with millimetric accuracy, something that has never been done before, and the direct consequence will be the early detection of inconsistencies in the design, and fast work planning, with the significant savings in time and resources that this entails.

3.-Use of 5G for streaming 3D scans of ship blocks under construction: Ship construction is approached in a modular way, in elements called "blocks". A critical aspect is the verification that each of the "blocks" will fit perfectly with the others. Today this task is done with 3D laser scanning tools that generate huge amounts of information that must be analysed locally by high-capacity computers. In this use case we will explore the possibility of taking advantage of the high bandwidth of 5G to send this 3D scan information via streaming to computers placed on the Edge Computing of the mobile network, so that this "3D reality survey" can be performed without the need to have high capacity computers on site, or to move highly specialised personnel to each site. In this ideal scenario, a single person would be able to verify the correct status of block fabrication at multiple locations without the need to travel to each site.

Video

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