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DIGITAL TWINS OF CITIES REVEAL A TRUE RAIN OF FAMILIARITY

Three years ago, ZOAN, a studio specialist in creating virtual worlds, released a complete digital twin of the city of Helsinki. At the time, they claimed it was the world's first virtual city. Of course, that wasn't the case, as Singapore, for example, already created its digital twin in 2015. But regardless of who claims first right here, the insights generated from city twins should generate a real initial spark. The example of Singapore in particular shows how the city adapts to aspects such as climate, environment or social structures. Virtual Singapore was created for this purpose, an initiative of the National Research Foundation (NRF), which in turn belongs to the government agency. Its mission is to create semantic 3D modeling that will, among other things, highlight the long-standing problem of urban heat island effects, but also to investigate the feasibility of new building developments and their impact on the immediate environment. The model will also identify potential infrastructure pitfalls and suggest appropriate solutions for the future Singapore. With Virtual Singapore, researchers have recently been aiming to reconstruct accident locations through digital forensics and scenario planning for autonomous vehicles and robots. But the project can do so much more, such as generating real-time dynamics as well as information on demographics, climate or traffic. On top of that, these 3D modelings are able to represent roads, curbs or stairs as they are. An essential point to design different ways to improve the accessibility of a given area, test them and keep the ones that give the best results. Virtual Singapore simulates likewise emergency situations in stadiums or shopping malls and creates the most optimal evacuation protocols. The tool can also analyze different modes of transportation and pedestrian movement patterns to better tailor the mobility system in the city. In terms of sustainability, the specific example of the Yuhua neighborhood shows how the carbon footprint improved with the introduction of solar panels, LED lights, pneumatic waste transport systems, and pedestrian and bicycle networks. Virtual Singapore includes a total of 3 million street-level images and 160,000 aerial images. More than a billion data points went into the 3D models, representing more than 100 terabytes of data. The software was developed by the French company Dassault