

Spatial Computing - Revolutionizing Industry and Mankind

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“Spatial Computing is human interaction with a machine in which the machine retains and manipulates referents to real objects and spaces”.

- Simon Greenwold, 2003



Smart and compact is the new lifestyle. And hence, our machines should also cope up with this lifestyle of our fast-moving lives, where performance shall not be compromised by the spatial aspects of our machines. Whether it be installing virtual forms into actual space or placing actual objects in a machine for digitization, it is Spatial Computing. To summarize, it is an umbrella term for Augmented, Virtual and Mixed Reality. Fueled by AI, Spatial Computing devices can spatially sense the world around us. Spatial Computing will be the next wave of disruptive technologies that will get its foothold in the 2020s.

The advancements in spatial technology also help a great deal in producing very accurate predictions, be it about the weather, spread of diseases, or any traffic congestion predictions. Overlaying virtual display data over real-time spaces using Augmented Reality Systems has been proven a powerful breakthrough in the fields of medicine, architecture, tourism and commerce, engineering, and everyday intelligence amplification. Geographical connections of fixed structures and moving objects (such as cars) using Spatial Web can help prevent road accidents and other mishappenings or also coordinate movement in smart cities. As smart cities are the future, spatial technology plays a predominant role in laying its foundations. GPS services for indoor localization can also be achieved using Spatial Computing. As most of the computing in Spatial Computing is based on Spatial Web, it is also prone to security breaches. With virtual content replacing actual objects, many people are also concerned about losing the touch and feel of objects. Though the transition from 2D to 3D space is essential as we spend all our lives in 3D space and interact with 3D objects, the real value of the 3D objects is lost. To integrate such computing power into small XR devices is also a great challenge. To compromise power with size is not acceptable to create technological magic. The Spatial Web refers to a computing atmosphere that exists in a 3D space. It expresses the idea of an unleashed Internet, present in the invisible digital skin growing over our world.

All in all, Spatial Computing makes digital twins not just of objects but of people and locations-using GPS, lidar (light detection and ranging), video, and other geolocation technologies to create a digital map of a room, a building, or a city. Software algorithms inte-

grate this digital map with sensor data and digital representations of objects and people to create a digital world that can be observed, quantified, and manipulated and that can also manipulate the real world. Spatial computing will soon bring human-machine and machine-machine interactions to new levels of efficiency in many walks of life, among them - industry, health care, transportation, and the home. Extended Reality is becoming such an accepted part of the tech sector that we will soon cease to distinguish Spatial Computing from computing in general. Spatial computing seems like the best vehicle for advancing our quality of life through technology.

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