

HE ROLE OF COMPOSITIONAL STRATEGIES IN AR ART: FROM MARKER-BASED TO MARKERLESS SYSTEMS

Over the past two decades, augmented reality (AR) has evolved from an experimental technology into one of the leading tools of contemporary art. AR art exists at the intersection of visual culture, digital technologies, interaction design, and spatial thinking. Within this context, composition plays a particularly significant role, as in AR it transcends planar or purely three-dimensional form-making and acquires a spatial-dynamic, contextual, and interactive character [1].

Unlike traditional art forms, composition in AR is not static; it depends on the physical environment, the viewer's position, the type of tracking, and the technical architecture of the system. The transition from marker-based to markerless AR systems has led to fundamental changes in artists' compositional strategies, opening new possibilities for scaling, nonlinear narration, and context-oriented artistic practices [2].

The aim of this study is to analyze the evolution of compositional strategies in AR art in relation to technological development from marker-based systems to markerless environments and to determine their influence on artistic language, perception, and interaction with the viewer.

In classical art theory, composition is understood as a system for organizing the elements of a work within a defined format. In digital art, this system becomes more complex due to the incorporation of time, interactivity, and programmatic logic. In AR art, composition takes on a hybrid nature by combining physical space with virtual objects.

Marker-based AR systems were the first widely accessible form of augmented reality. They rely on visual marker - such as QR codes, graphic patterns, or images - that serve as anchoring points for virtual content. Composition in marker-based AR is characterized by the following features:

- locality, the virtual object is rigidly attached to a marker;
- frontality, the logic of "screen-based" thinking is often preserved;
- limited scale, the composition exists within the camera's field of view;
- static environment, the physical space functions primarily as a background.

These characteristics bring marker-based AR closer to traditional graphic art or object design, where composition is structured around a central element [3].

The development of SLAM algorithms (Simultaneous Localization and Mapping), computer vision, and sensor technologies has led to the emergence of markerless AR systems capable of

analyzing space in real time without the use of predefined visual markers. This transition has resulted in a radical shift in compositional strategies. In markerless AR, composition is no longer confined to a single anchoring point.

The artist no longer thinks in terms of a "frame" but rather in terms of an environment, where composition unfolds across space and time. Consequently, composition becomes site-specific and inseparable from a particular location. Markerless systems enable the creation of nonlinear compositional structures in which the viewer independently chooses a path, the narrative is formed individually, and the composition changes according to the user's actions. This brings AR art closer to performative and game-based practices [4].

In AR art, the viewer ceases to be a passive observer. Their movement, position, gestures, and even the duration of interaction become integral components of the compositional structure. In markerless systems, the viewpoint is constantly shifting, the composition is "assembled" through interaction, and there is no single "correct" or fixed form of the artwork [5].

This fundamentally alters traditional notions of authorship, completeness, and stability in art. The evolution from marker-based to markerless AR systems has caused profound transformations in compositional strategies within contemporary art. Composition in AR has ceased to function as a fixed structure and has instead acquired the characteristics of a procedural, open, and environment-based system. Markerless AR art thus forms a new artistic paradigm in which space, technology, and the viewer are integrated into a unified compositional network. Further research in this area is promising both for art history and for interdisciplinary studies of culture in the digital age.

References

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