

## Design and Implementation of Collaborative Editing System Based on Physical Simulation Engine Running State

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**Abstract :** The application of physical simulation engines in collaborative editing systems has an important background and role. Firstly, physical simulation engines can provide real-world physical simulations, enabling users to interact and collaborate in real time in virtual environments. This provides a more intuitive and immersive experience for collaborative editing systems, allowing users to more accurately perceive and understand various elements and operations in collaborative editing. Secondly, through physical simulation engines, different users can share virtual space and perform real-time collaborative editing within it. This real-time sharing and collaborative editing method helps to synchronize information among team members and improve the efficiency of collaborative work. Through experiments, the average model transmission speed of a single person in the collaborative editing system has increased by 141.91%; the average model processing speed of a single person has increased by 134.2%; the average processing flow rate of a single person has increased by 175.19%; the overall efficiency improvement rate of a single person has increased by 150.43%. With the increase in the number of users, the overall efficiency remains stable, and the physical simulation engine running status collaborative editing system also has horizontal scalability. It is not difficult to see that the design and implementation of a collaborative editing system based on physical simulation engines not only enriches the user experience but also optimizes the effectiveness of team collaboration, providing new possibilities for collaborative work.

**Keywords :** physics engine, simulation technology, collaborative editing, system design, data transmission

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