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Realtime remote rendering of GPGPU accelerated Schrödinger's Smoke

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This paper focuses on integrating a Schrödinger smoke calculator GPGPU into existing interactive content display systems. The architecture of the three technology-based visualization approaches is compared:
- server-side rendering with ParaView
- server-side rendering with NoVNC
- local rendering on the client when processing model data on the server side.
- local rendering and model computation on the client resources.

The paper analyzes the quality of these approaches by analyzing the architecture, FPS, and latency of the created prototypes for various approaches that we present. Both server-side and client-side rendering were performed on the same model code base that utilizes CUDA 10.1 and ArrayFire for Schrödinger Smoke computation, while Unity3d and ParaView were utilized for rendering.

The study showed how high utilization of coprocessors on the server side leads to complications in solving the problem of real-time display of information. Aspects of multi-user application of the created technology and related limitations were also considered. The prospects and problems of its development and integration into user applications are shown.

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