Accurate Water Simulation for Visibility Driving

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In this paper we will present a system for the real-time simulation of rain falling on a windscreen. Our model incorporates external forces like gravity and wind, and also simulates how the rain gets removed from the windshield by the windscreen wipers. The algorithm is based on the Lattice-Boltzmann Method (LBM), which consists of a regular lattice that represents the fluid in discrete locations, and equations to simulate its flow. We perform all the computations of the LBM on graphics processors for accelerating the calculations. We render the results of the LBM simulation using an approximate image-space approach for interactive refraction, which allows the computation of refractions of a distant environment through two interfaces.