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Distributed Actor System for Traffic Simulation

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Abstract : In traditional microscopic traffic simulation, various approaches have been suggested to implement the single-agent behaviors about lane changing and intelligent driver model. However, when it comes to very large metropolitan areas, microscopic traffic simulation requires more resources and become time-consuming, then macroscopic traffic simulation aggregate trends of interests rather than individual vehicle traces. In this paper, we describe the architecture and implementation of the actor system of microscopic traffic simulation, which exploits the distributed architecture of modern-day cloud computing. The results demonstrate that our architecture achieves high-performance and outperforms all the other traditional microscopic software in all tasks. To the best of our knowledge, this the first system that enables single-agent behavior in macroscopic traffic simulation. We thus believe it contributes to a new type of system for traffic simulation, which could provide individual vehicle behaviors in microscopic traffic simulation.

Keywords : actor system, cloud computing, distributed system, traffic simulation
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