Avoiding phantom jams in traffic

- Simulations with agent-based models

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Abstract

Det här är en sammanfattning. Test of reference to [1].

1 Driver model

Several driver models have been developed to simulate different traffic situations. These models describe the position and velocity of each car in the simulation and can then much easier be compared with empirical data than in macroscopic models. Intelligent Driver Model (IDM) is a car-following model and belongs to the deterministic kind of microscopic models.

The IDM control the position of the car on a single-lane road. The position depends on the velocity and acceleration of the car. Acceleration is described by the velocity v_α and distance to the car in front s_α. These two parts are related to the desired velocity v_0 and effective desired distance s^*. The equation for acceleration then becomes: $\dot{v_\alpha} = a(1 - (\frac{v_\alpha}{v_0})^\delta - (\frac{s^*}{s_0})^2)$ Desired distance between the cars is calculated from minimum distance s_0, time headway T and difference in velocity Δv. $s^* = s_0 + max(v_\alpha T + \frac{v_\alpha \Delta v}{2\sqrt{ab}}$

References

[1] Y. Sugiyama et al. Traffic jam without bottlenecks. *New Journal of Physics*, 10(033001), 2008.