



An approximate Bernoulli process for information propagation along two parallel roads

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Abstract

This research studies information propagation via inter-vehicle communication along two parallel roads. By identifying an inherent Bernoulli process, we are able to derive the mean and variance of propagation distance. A road separation distance of $\frac{\sqrt{3}}{2}$ times the transmission range distinguishes two cases for approximating the success probability in the Bernoulli process. In addition, our results take the single road as a special case. The numerical test shows that the developed formulas are highly accurate. We also explore the idea of approximating the probability distribution of propagation distance with the Gamma distribution.

Keywords

Network inter-vehicle communication; Stochastic process; Bernoulli process

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