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## **Gilbert-Elliot Performance Modeling of Vehicular-to-Vehicular Packet Transmissions**

Abstract—Safety applications of Cooperative Intelligent Trans- port Systems (C-ITS) are limited in their performance by the latency of the communication more than by the achieved throughput. However, there exist few models at packet level that are able to capture the burstiness of the communication. We therefore introduce a packet error model that considers burstiness as well as mean packet errors. The foundation of our approach is the Gilbert-Elliot model, which is able to model not only the packet error rate, but also the burst durations of the packet errors, which we interpret in a time variant fashion. We formulate maximum likelihood expressions for the time variant model fits, and then proceed to fit the parameters to extensive recorded measurements. We consider the fading statistics of the measured channel as well as the Signal-to- Noise Ratio (SNR) and present how they influence the channel burstiness. Our analysis demonstrates that the communication shows strong bursts at packet level, proving the requirements for such models. The approach we demonstrate here remains of low computational complexity, allowing future employment in large-scale simulations.

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