On Channel Estimation for 802.11p in Highly Time-Varying Vehicular Channels

Author(s) - Institution(s):
Keerthi Kumar Nagalapur, Chalmers
Fredrik Brännström, Chalmers
Erik G. Ström, Chalmers

Corresponding author email: keerthi@chalmers.se

Corresponding WG group: TWGV

Abstract:

Vehicular wireless channels are highly time-varying and the pilot pattern in the 802.11p orthogonal frequency-division multiplexing frame has been shown to be ill suited for long data packets. The high frame error rate in off-the-shelf chipsets with noniterative receiver configurations is mostly due to the use of outdated channel estimates for equalization. This paper deals with improving the channel estimation in 802.11p systems using a cross layered approach, where known data bits are inserted in the higher layers and a modified receiver makes use of these bits as training data for improved channel estimation. We also describe a noniterative receiver configurati on for utilizing the additional training bits and show through simulations that frame error rates close to the case with perfect channel knowledge can be achieved.