Busy/Idle Duration Prediction for Video and Audio WLAN Traffics Using Autoregressive Predictor with Data Categorization

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Abstract—**Due to huge access from massive devices and peoples such as hospitals, railway stations and airports, wireless local area network (WLAN) is required to have high spectrum efficiency (SE). One of the most intensively researched techniques for wireless LAN systems is cognitive radio (CR) technique which is expected to solve such issue by modeling and predicting of channel status from the current statistics information of spectrum usage. In this paper, we investigate the prediction performance of busy/idle (B/I) duration of two major and widely used wireless services : video service; and audio service using an auto-regressive (AR) based predictor. We first investigate the modeling of their busy/idle duration and analyze their predictability based on predictability theory. Then, we categorize the durations of recent B/I statuses with their ranges to make the duration of the next status be distributed into different sets or streams with different ranges. From their predictability and prediction performance using the low-complexity AR-based predictor, we can confirm that data categorization can largely improve the prediction performance of partial time-series data.**

Keyword—**Channel status prediction; WLAN traffic; Autoregressive predictor; Data categorization.**

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