



Augmenting Drive-thru Internet via Reinforcement Learning Based Rate Adaptation



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► Abstract

Modern vehicles are connected through powerful radio access technologies and can exchange massive information with their surrounding environment. Drive-thru Internet has been considered as an effective Internet access method for Internet of vehicles (IoV). Through the opportunistic vehicle-to-roadside WiFi connection, it can provide high throughput performance with low communication cost for IoV applications. However, its usability is highly affected by a fundamental issue called rate adaptation (RA), which is to adjust the modulation and coding rate to adapt to the dynamic wireless channel between the vehicle and the roadside access point. Conventional WiFi RA schemes are designed for indoor or quasi-static scenarios, and do not account for the channel variations in drive-thru Internet. In this talk, we study the limitation of existing RA schemes in drive-thru Internet and propose a reinforcement learning (RL) based RA scheme to capture the potential channel variation patterns and efficiently select the rate for every vehicle's egress frame. Simulation results demonstrate that the proposed RA scheme outperforms the existing schemes in network throughput, and that the efficiency of the learning model can be generalized under various conditions. The proposed RA method can provide useful inspirations for designing robust and scalable link adaptation protocols in IoV.

► About the Speaker

Wenchao Xu received the B.E. and M.E. degrees from Zhejiang University, Hangzhou, China, in 2008 and 2011, respectively. He received the Ph.D. degree from the Department of Electrical and Computer Engineering, University of Waterloo in 2018. In 2011, he joined Alcatel Lucent Shanghai Bell Co. Ltd., where he was a Software Engineer for telecom virtualization. His research interests include wireless communications with an emphasis on resource allocation, AI enable Internet of things, and edge computing.

ALL are welcome!

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