Wireless Engineering Research and Education Center

# IMPROVING THROUGHPUT OF VIDEO STREAMING IN WIRELESS SENSOR NETWORKS

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## Abstract

Wireless sensor networks are originally distributed event-based systems that differ from traditional communication networks in several ways. These networks typically have nodes with severe energy constraints, variable quality links, low data-rate and many-to-one event-to-sink flows. Recently, Wireless Multimedia Sensor Networks (WMSNs) have been developed with the availability of low-cost cameras, microphones, and other sensors producing multimedia data. The applications, accordingly, are extended to video surveillance and notification, video and computer assistance in living, etc. The stringent requirements of real-time multimedia applications include end-to-end delay, bandwidth and loss during data transmission. Communication algorithms for WMSN must therefore be specially designed to operate efficiently under these constraints. Directed diffusion is a data-centric protocol designed for wireless sensor networks. However, it is not efficient in more challenging domains, such as video sensor networks, because of inability to satisfy the stringent QoS requirements of Real-time multimedia transport has, such as bandwidth, delay, jitter, and loss ratio. Wireless sensor networks are composed of nodes with constrained bandwidth and energy and this makes the problem of video transmission even more complicated. In QoS routing for wired networks, multipath routing is widely used. Some existing ad hoc routing algorithms also provide multipath routing. Directed diffusion has been commonly used for wireless sensor networks because of its energy efficiency and scalability. However, the basic protocol only routes packets through a single path, which barely meets the throughput requirement of multimedia data. Instead, we propose an efficient multipath algorithm named Delay Constrained High Throughput Protocol (DCHT) based on directed diffusion that reinforces multiple routes with high link quality and low latency. We use the NS-2 simulation tool with video trace generated by Multiple Description Coding (MDC) to evaluate the performance. The results show that our algorithm gives better throughput and delay performance than standard directed diffusion.

## Bio

Raghu Kisore Neelisetti is a Graduate Research Assistant pursuing his Ph.D. degree in Computer Science and Software Engineering at Auburn University. His advisor is Prof. Alvin Lim. He received a Master's degree in Computer Science and Engineering from Indian Institute of Technology, Madras in 2001. He was awarded a Vodafone Fellowship in 2006. His research interests include Wireless Sensor Networks and Vehicular Networks.

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