# Optimal Cost for VANETS Streaming Distributions

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**ABSTRACT**

***Streaming applications will rapidly develop and contribute a significant amount of traffic in the near future. Distribute video streaming traffic from one source to all nodes in an urban vehicular network. This network differs from previous work on broadcast & multicast in ad hoc networks because of the highly dynamic topology of vehicular networks and the strict delay requirements of streaming applications. We present a solution for vehicular communications, called Streaming Urban Video that 1) is fully distributed and dynamically vary to topology changes and 2) leverages the characteristics of streaming applications to yield a highly efficient, cross-layer solution.***

***KEY-WORDS***

***SUV, Streaming urban video***
***VANETS, Vehicular Ad HOC network***
***VBR, Variable bit rate***
***GPS, Global positioning system***
***SAR, Segmentation & reassembly***
***TDMA, Time division multiple access***

## I. INTRODUCTION

IT is commonly acknowledged that Vehicular Ad Hoc Networks are ill-suited to support streaming media traffic, fleeting connectivity, low bandwidth, and highly dynamic unpredictable topology are the main shortcomings hindering the support of multimedia applications. The network properties, along with the variable bit rate nature of the traffic and the strict delay of the device, making no allowance for store and forward, pose a different problem from the ones previously addressed in ad hoc networks. Even in the case of VANETs, the literature carries few solutions dealing with channel access and traffic forwarding for the support of streaming media and the majority of them considers a highway scenario or does not leverage the application characteristics

(a more detailed discussion of related works can be found in).In this work, we propose a fully distributed solution called Streaming Urban Video that efficiently disseminates streaming video to all vehicles in a city VANET. SUV completely relies on inter-vehicular communication: a video stream, generated in a point in space (e.g., at a roadside access point), is fed to SUV nodes and known across the VANET through a distribution structure, which is kept over the physical topology of mobile nodes. We refer to the node that belongs to the distribution structure and are responsible for the forwarding of the streaming video as relay nodes. The streaming video distribution in SUV therefore occurs through a mix of local broadcasting from a relay node to its neighbouring nodes and MAC-layer multicasting from a relay node to its next-hop relay nodes. Ideally, we would like the distribution structure to be a grid, so as to make small the number of relay nodes required to cover a network area while providing a good level of connectivity. To this aim, in SUV, each relay node not only forwards the streaming traffic but also exploits a built-in positional device (e.g., a GPS) and received the power level, to dynamically select its next-node relays, so that the sharing structure always approximates a grid as close as possible. We expand that due to the time-varying network topology, the gateway can select any relays for each newly generated packet and any relay node selects its next hop relay nodes according to the current status of its neighborhood. It follows that the large set of relays thus identified represents a sharing structure that continuously adapts to the network topology changes. The GPS signal is also used to synchronize all relay nodes to a structured TDMA transmission, as done in several other workshops. To efficiently schedule the transmission of relay nodes and thus decrease the chance of collisions. We sort out some results from graph-coloring theory and apply them to the distribution structure. Unlike the work in [9], we do not make any assumption on the nodes density and define a distance-k coloring, with k being any positive integer, which is the most favorable and has the same asymptotic complexity as the algorithm. Clearly, due to collisions stemming from no ideal grid selection, the scheduling algorithm may sometime don't work and result in bandwidth waste. To tackle this problem, SUV nodes are capable of -1) detecting a collision by means of passive acknowledgments at the MAC layer, 2) claim back the part of the wasted bandwidth to solve the problem, and 3) salvaging a failed transmission by sending a reduced amount of information. The last approach (here in after called "opportunistic access") is particularly amenable to cross-layer interactions between the application and the MAC layer, such as the applying of multiple-description video streams allowing the selective discarding of descriptors. In addition, when VBR video is transferred, each stream can be seen as one another other of the bursts at peak rate, intervals with periods of little or no activity. SUV leverages the traffic properties and hence, the left over bandwidth at the MAC layer, to support best data traffic via a declared, based access, thus enhancing radio resource efficiency. The remainder of the paper is organized as follows: We introduce the system model. The SUV scheme is briefed in as a fully distributed solution spanning several layers from the application to the MAC layer. By applying graph coloring theory, we derive a scheduling algorithm that is specifically 1) designed for our scenario and 2) aims at maximizing the distance between the closest pair of nodes that simultaneously access the same radio resources. We also include the study of the performance of SUV against theoretical results for broadcast capacity in multi hop networks, as well as of its specific purpose to support the video streaming in a realistic vehicular scenario.

## II. EXISTING SYSTEM

Streaming applications will rapidly develop and contribute a significant amount of traffic in the near future. A problem can be seen, short time addressed so far, is how to share video streaming traffic from one source to all nodes in an urban vehicular network. This problem totally differs from the previous work on broadcast and multicast in ad hoc networks because of the highly dynamic topology of vehicular networks and the strict delay requirements of streaming applications.

## III. PROPOSED SYSTEM

The proposed model presents a solution for inter vehicular communications, called Streaming Urban Video (SUV), that 1) is fully distributed and dynamically adapts to topology changes, and 2) leverages the characteristics of streaming applications to yield a highly efficient, cross-layer solution.

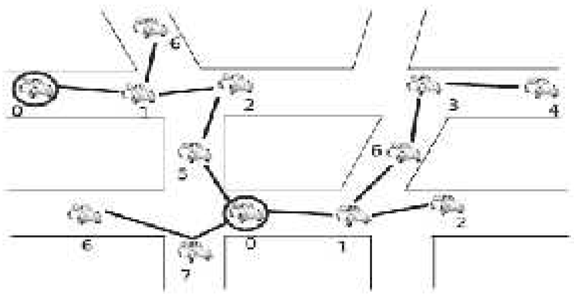
## IV. MODIFICATION

This workshop is to present and discuss recent advances in the development of vehicular inter-networking (VANET) technologies. The creation of high-performance, highly reliable, highly scalable, secure, and privacy-preserving VANET technologies presents an extraordinary network for the wireless research community. VANET present a very active field of research, development, standardization, and field trials.

## V. RELATED WORK

Consider a VANET deployed in an urban environment. We make no conclusion on the vehicle density since, as shown, SUV can achieve a good performance even with spots and patches, volatile vehicular connectivity. We assume that one or more gateway rely nodes, either fixed or variable, provide streaming video to car passengers. Video streaming include news, tourist details, commercial ads, football games, or music video clips. Allotment of multimedia content relies on inter vehicular communication; in addition, vehicles may exchange to best-effort data traffic in a peer-to-peer fashion: news briefing, public transportation timetables, traffic warnings, and so on. As we define the node transmission range as the maximum distance at which the expected packet error rate is still agreed, namely, equal to 0.08 as in the 802.11 standard, and we indicate the corresponding received power level by $P^{th}_{rx}$ . This power level, measured in dBm, varies on the node wireless interface and data rate. All network nodes are supposed to be equipped with a positioning system, such as GPS, so that they know their location and accurately synchronized in time. Each vehicle arrange in manner to broadcasts an in-band HELLO signal message, which carries the sender's ID and GPS position. A vehicle can therefore keep an updated list of its 1) hop neighbors, i.e., the nodes from which it receives a HELLO with power level that is equal to or greater than $P^{th}_{rx}$, and 2) the position and the power level received from each of its 1-hop neighbors.Streaming video and best-effort traffic (the latter including HELLO messages) are transmitted over the node data channel, which is organized according to a TDMA structure. The data channel is structured in fixed length time frames of the TF. Each time frame is further divided into S identical slots, where the value of S, as well as the subset of relay nodes that transmit in each time slot is determined using the graph-coloring algorithm. The multimedia content is assumed to be a video sequence. Note that various video coding procedures have been defined to allow streaming video to withstand the potentially harsh conditions of wireless networks; examples are multiple descriptions and layered coding. Here, we consider the video to be encoded into three descriptors although other techniques could be considered as well. Each descriptor is made of several video frames (e.g., I, B, or P) of different size. The node transmission stack includes a segmentation and reassembly layer, such that, at the transmitter, each video frame is segmented and formatted into a packet that will cover up to one third of a MAC payload of most complete size. In other words, every MAC packet to be transmitted in a time slot carries three (or parts of three) video frames, each following to a different descriptor. The SAR title also carries the video frame sequence number. At the receiver, the SAR layer rearrange (if both necessary and possible) different parts of the same video frame and send the video frame to the upper layers. We prominent that due to the VBR nature of video traffic, I-frames are typically very large, while P frames are small. This implies that when an I-frame needs to be transmitted to one or more slots will be full; when, instead, P frames are sent, a large portion of the slot will remain free and can thus be reused for best-effort traffic.

## VI. ARCHITECTURAL DIAGRAM



## VII. INTER-VECHILE COMMUNICATION

The inter-vehicle communication configuration (Fig. 1) uses multi-hop multicast/broadcast to transmit traffic related information over multiple hops to a group of receivers. It come under the Intelligent transportation systems (ITSs).

**Fig. 1** Inter-vehicle communication

## VIII. MODULE DESCRIPTION

**MODULES**

1. NETWORK CONSTRUCTION
2. MOBILITY
3. ZONE IDENTIFICATION
4. VIDEO STREAMING
5. DATA TRANSFER

### 1. NETWORK CONSTRUCTION

This module is developed in order to create a dynamic network. In a network, nodes are reciprocally connected and the resources can be shared among them. For the successful data transfer the network must be properly controlled and handled. Each region of nodes depends upon the access points with the server. A node can be a unicast and Multicast Here we Decide that how many nodes are going to be used to form a region with access points to the server to share the information.

**2. MOBILITY:**

This module deals with the solution for inter vehicular communication through Streaming Urban Video. This is to overcome the amount of traffic caused by the streaming application at present. In this module, easy transfer of streaming applications is done by means of transferring it through intermediate multiple moving vehicles. Mobility plays a major role in quick data transfer.

**3. ZONE IDENTIFICATION**

In inter vehicular communications, the each and every vehicle consist of the VANET receiver in order to receive the streaming signal sent by the VANET sender. This is distributed dynamically and adopts according to the location of the vehicle. The sender sends the streaming signal within the particular region in which particular vehicles are present inside it. In this network, there are more zones so that the signal will be transferred among the zones.

**4. VIDEO STREAMING:**

The Streaming Urban Video deals with fully distributed and it has the capability of dynamically adapting according to the topology changes and it has leverages the characteristics of streaming applications to yield a highly efficient, cross-layer solution for the streaming application across the network.

**5. DATA TRANSFER:**

Data transfer is done efficiently by using this Streaming Urban Video (SUV) and hence fast data transfer is possible without the necessity of fitting the Streaming Video transmitter in all of the intermediate vehicles.

## IX. IMPLEMENTATION & RESULT

Java1.6 or More

JMF2.1

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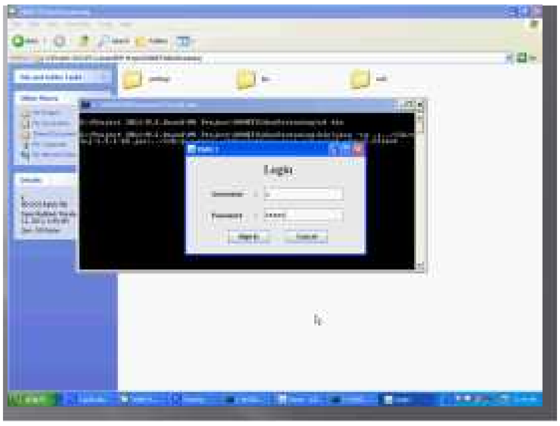
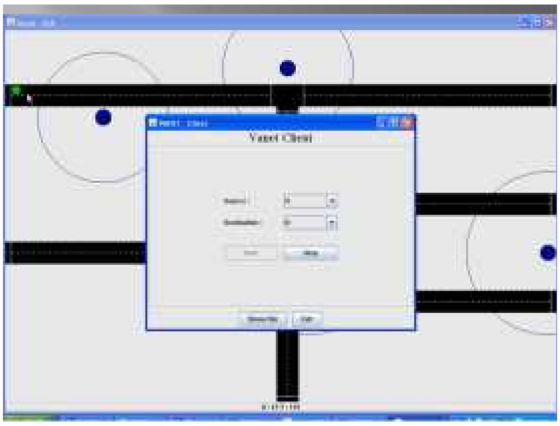
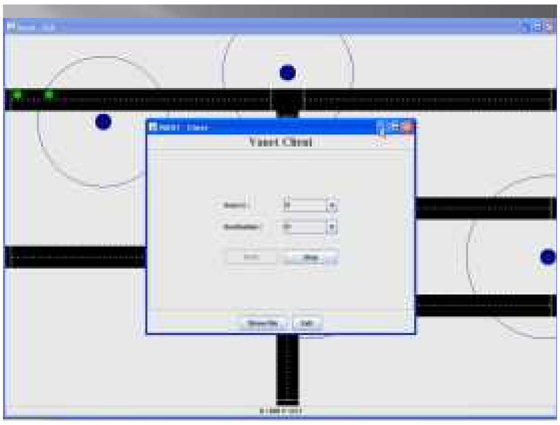
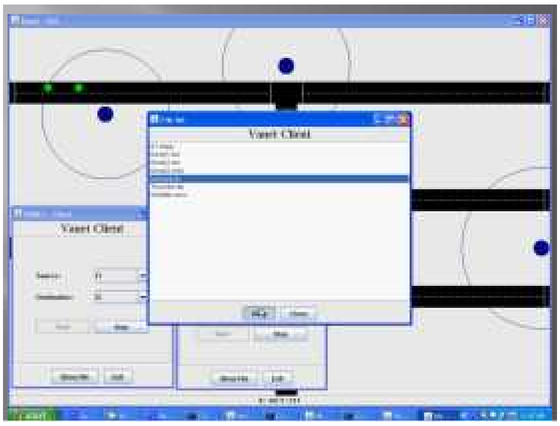
|---|---|---|
| Hard disk | : | 40 GB |
| RAM | : | 510MB |
| Processor | : | Pentium |

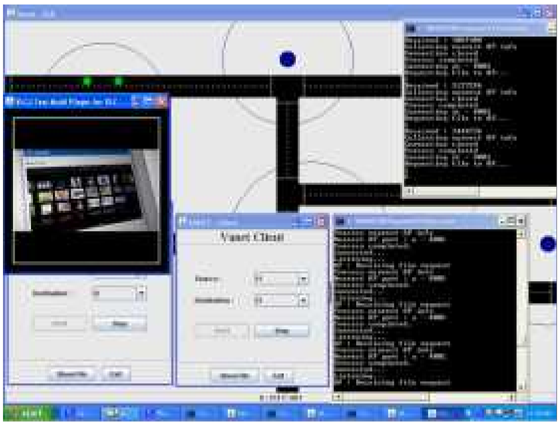










## X. CONCLUSION

We addressed the issue of on-board live video streaming in VANETs by providing a comprehensive solution, SUV, covering several architectural layers. The content distribution is gained through a fully distributed dynamic selection toward the front, which, in turn, performs local broadcasting. Graph coloring is developed to solve the scheduling problem and optimize the special separation of concurrent streaming transmissions. Whenever a crash occurs, SUV leverages the properties of video coding to design a collision-resolution mechanism and the characteristics of VBR traffic to efficiently exploit radio resources.

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