

CONDITIONAL
TRANSMISSIONS:
PERFORMANCE STUDY OF A
NEW COMMUNICATION
STRATEGY IN VANET

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OUTLINE

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- INTRODUCTION
- NEW APPROACH FOR VANET
- CONDITIONAL-TRANSMISSION TECHNIQUE
 - ▣ *Principle*
 - ▣ *Useful Conditions*
 - ▣ *Performance Discussion*
- PERFORMANCE STUDY
- CONCLUSION

INTRODUCTION

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- The topological routing algorithms
 - ▣ more control messages are required
- The geographical routing protocols
 - ▣ bandwidth wastage
- The hierarchical routing protocols
 - ▣ The overhead needed to build such clusters increases and the clusters are less stable

INTRODUCTION

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- The movement-based routing protocols
 - ▣ it is not sufficient nor practicable in all the situations
- The broadcasting-based routing protocols
 - ▣ requires more control messages and then consumes more bandwidth when the dynamic increases

NEW APPROACH FOR VANET

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- *Avoiding the Addresses*
- *Path Maintenance*
 - consists in the maintenance of a communication that began when the receiver was in the neighborhood of the sender
- *Conditional Transmission*

NEW APPROACH FOR VANET

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- conditional addressing instead of network addressing
- path maintenance instead of traditional unicast
- conditional transmissions instead of broadcast

CONDITIONAL-TRANSMISSION TECHNIQUE :*Principle*

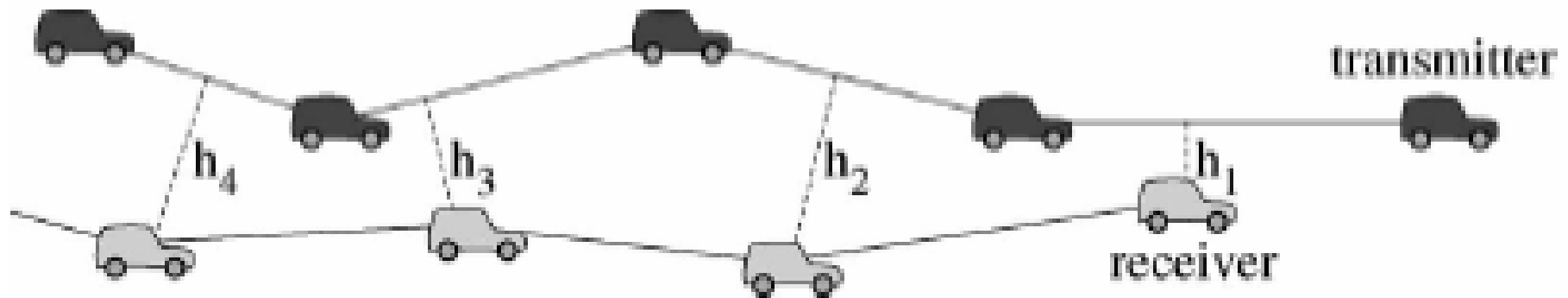
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- it is passed by to the application layer if CUP(the upward condition) is true
- it is forwarded to the neighbors when CFW(the forward condition) is true.
- the conditional transmission has no impact on the security of the routing layer.

trajectory-matching algorithm

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- They can also concern trajectory-related information to determine whether a mobile is on the same trajectory than the sender or not.
- compare $(h_1 * w_1 + h_2 * w_2 + \dots)$ to a predefined empirical threshold



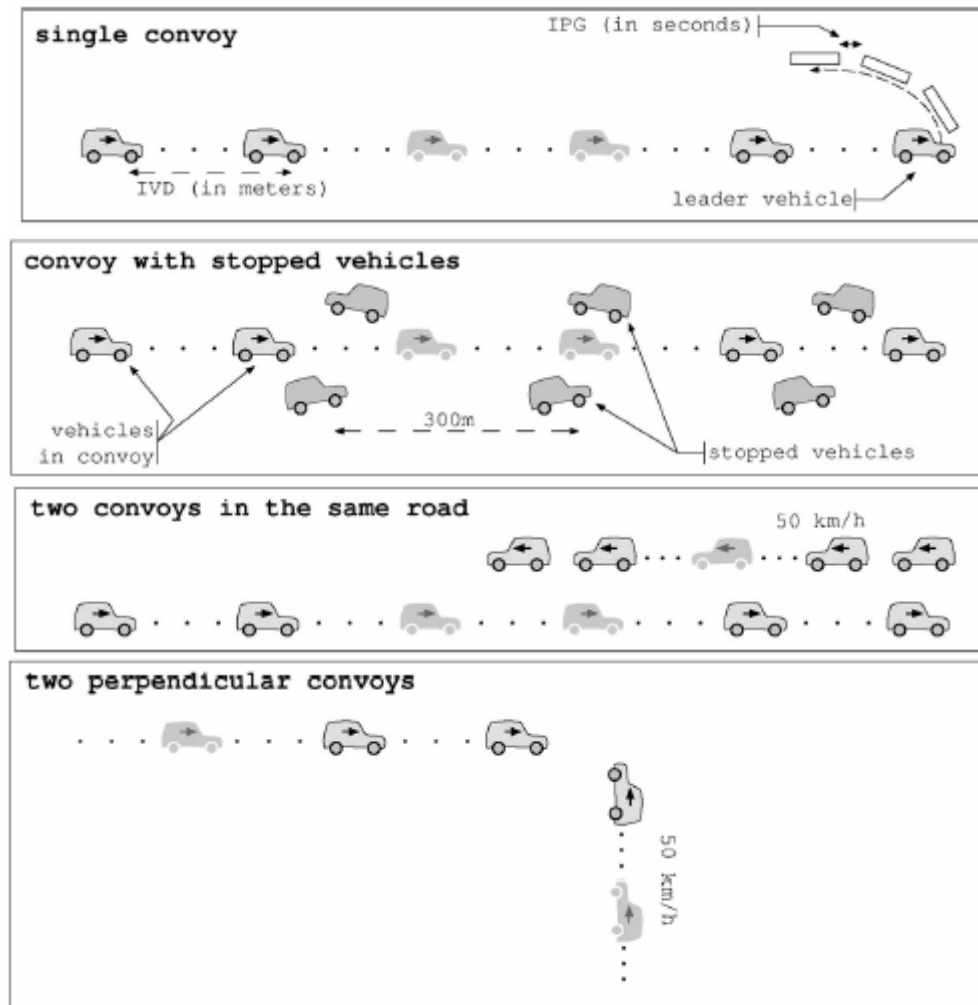
Performance Discussion

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- *Control Overhead*
 - ▣ The header is about 200 B
 - ▣ a conditional transmission does not require control messages
- *Processing Time*
 - ▣ In [8], the impact of the interpacket gap (IPG) in intervehicle wireless communications is studied
- *Collisions*
 - ▣ A condition such as “ $\text{rand}() < 1/n$ ”

Simulation Methodology

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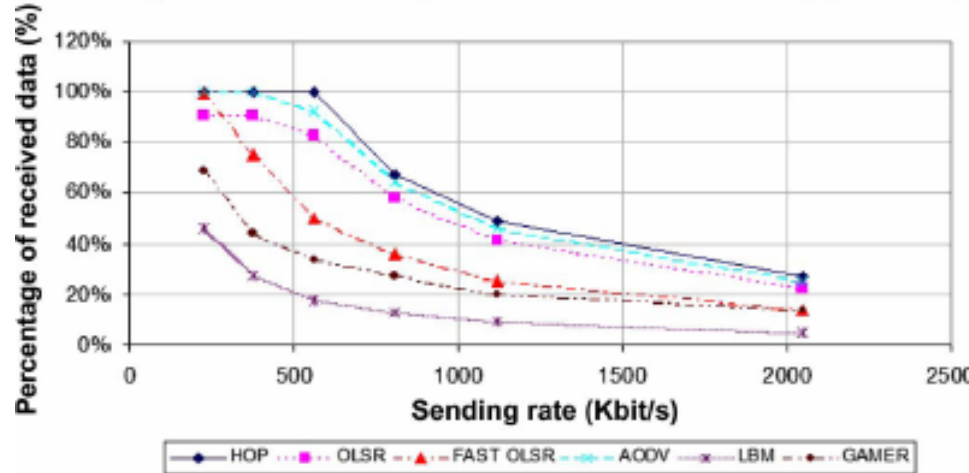
Simulator Configuration

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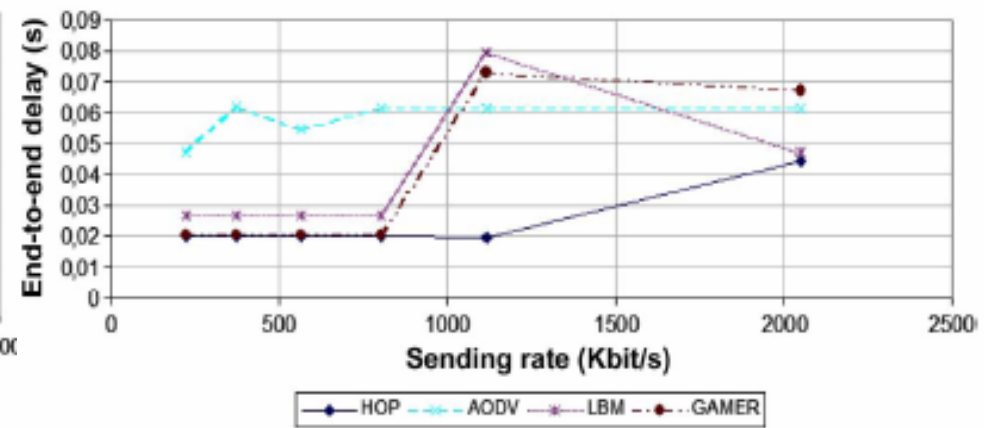
- The transport protocol is UDP
- consider 20 vehicles per convoy

Single Convoy

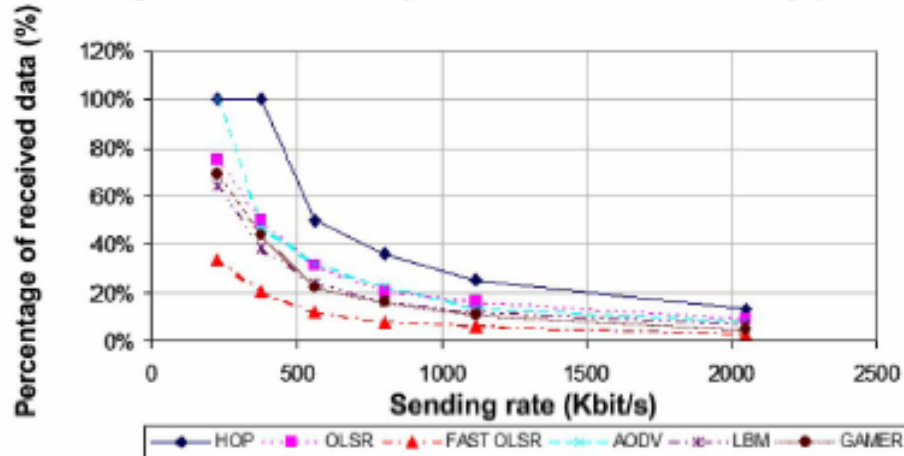
Percentage of received data by the last vehicle in the convoy (DIV=27m)



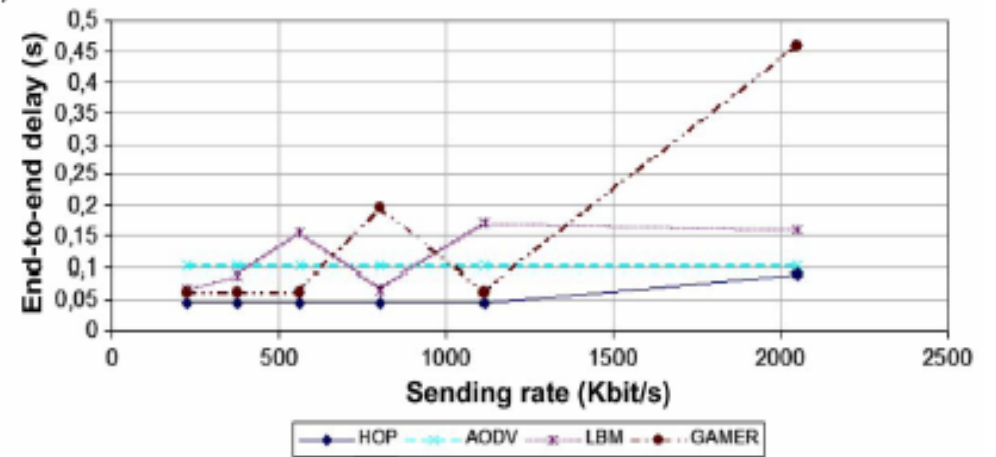
End-to-end delay for the first packet in the convoy (DIV=27m)



Percentage of received data by the last vehicle in the convoy (DIV=72m)



End-to-end delay for the first packet in the convoy (DIV=72m)



The Other Road-Traffic Scenarios

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	OLSR	Fast OLSR	AODV	HOP
Single convoy	21 %	8 %	23 %	36 %
With stopped veh.	14 %	2 %	15.7 %	36 %

	OLSR	Fast OLSR	AODV	HOP
Single convoy	21 %	8 %	23 %	36 %
With crossing convoy	7 %	2 %	15.7 %	36 %

	OLSR	Fast OLSR	AODV	HOP
Single convoy	21 %	8 %	23 %	36 %
With perp. convoy	12 %	2 %	15.7 %	36 %

CONCLUSION

- Conditional transmissions Instead of transporting addresses or positions, a message is sent with some conditions used for retransmission or reception.
- Conditional transmissions can efficiently support the high dynamic of the networks
- The simulation results show that the conditional transmissions offer better performances than the other algorithms and is not affected by the road-traffic scenario.