

## Tutorial: MAC (medium Access Control) Schemes for Message Dissemination in Vehicular Ad Hoc Networks

Duration: 3 hours (half a day)

### Speaker

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### Abstract

The successful dissemination of emergency messages in vehicular ad hoc networks can make a difference between life and death. To achieve the life-saving goals, emergency message dissemination needs timely and lossless medium access in vehicular ad hoc networks. In the literature the existing medium access control (MAC) protocols for can be categorized into two groups: one focusing on scheduling unicast traffic, and the other focusing on broadcasting emergency traffic. This tutorial will provide an overview of the medium access control issues in wireless networks, a detailed look about the priority scheduling in vehicular ad hoc networks, and a comparative study of the MAC protocols for broadcast traffic in vehicular networks.

### Outline

Part I: MAC in wireless networks (1 hour)

- Introduction to computer networks and the OSI architecture
- Medium access control in ALOHA
- Medium access control in IEEE 802.11

Part II: Priority scheduling in vehicular ad hoc networks (1 hour)

- Medium access control in vehicular ad hoc networks: challenges
- Priority scheduling in vehicular ad hoc networks: needs and challenges
- Busy tone priority scheduling
- Distributed priority scheduling

Part III: Broadcast MAC in vehicular ad hoc networks (1 hour)

- Broadcast MAC in vehicular ad hoc networks: challenges
- Vehicle-to-vehicle safety messaging in DSRC
- Statistical-priority based MAC protocols
- Strict-priority based MAC protocols

### Profile

**Liang Cheng** currently directs LONGLAB (Laboratory Of Networking Group) as an Assistant Professor of Computer Science and Engineering at Lehigh University. He advises three Ph.D. students and has graduated three Ph.D. students and supervised one postdoc and two visiting scholars. He has published extensively in venues such as IEEE Transactions on Mobile Computing, IEEE Transactions on Vehicular Technology, IEEE Transactions on Wireless Communications, and major conferences; and holds one U.S. patent in the research areas of heterogeneous data networks and

their supporting middleware, which integrate Inter-, ad hoc, and sensor networks. He has been the Principal Investigator (PI) and a Co-PI of seven projects supported by the National Science Foundation (NSF), the Defense Advanced Research Projects Agency (DARPA), Pennsylvania Department of Community and Economic Development, and Agere Systems, Inc. Liang was the Program Chair of 2005 IEEE Sarnoff Symposium on Advances in Wired & Wireless Communications, which had over 200 attendees and featured 56 technical papers, 2 panels, inspiring keynote speakers including President and CEO of BBN Technologies, 10 tutorials as well as a student poster session and an exhibition, and its impact resulted in a 50% increase of paper submissions to 2006 IEEE Sarnoff Symposium. Dr. Cheng is an awardee of Christian R. & Mary F. Lindback Foundation Minority Junior Faculty Award.