In Search of Interesting VANET Theory Problems

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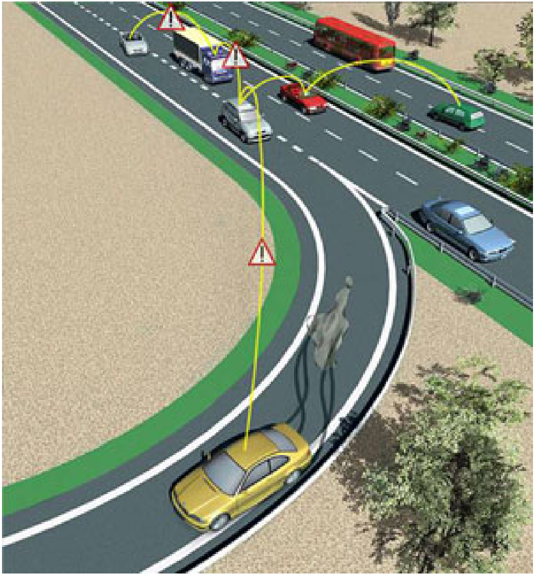
TDS Seminar

October 16, 2009

Outline

A VANET Primer



What Makes VANETs Interesting

A VANET is a type of *MANET* in which the mobile nodes are vehicles. The intended communication is vehicle to vehicle, and vehicle to static roadside equipment.

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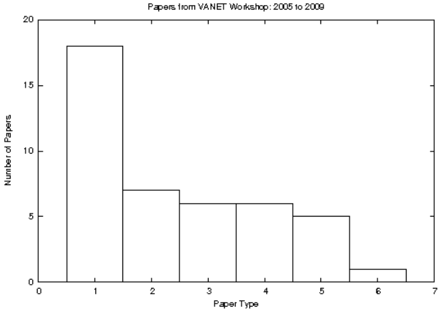
- Interaction with roadside equipment is predictable.
- Portability issues are not a problem (computational power, energy, antennas, etc.)
- Location information can be assumed.

VANET Problems



- **1** : Ideas validated with simulation.
- **2** : Simulation issues.
- **3** : Security issues.
- **4** : Measurements from real deployments.
- **5** : Analytic modeling.
- **6** : Optimization.

VANET Problems

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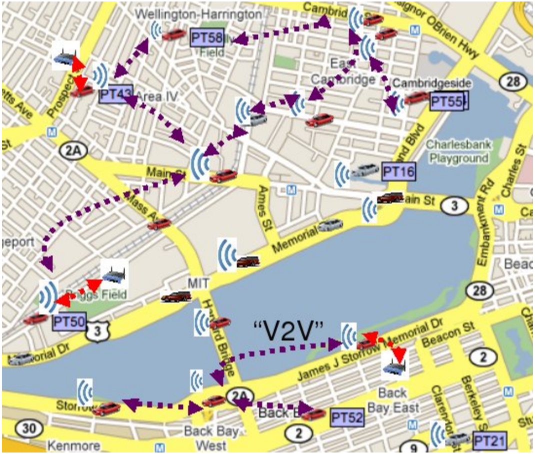
- Building better simulations.
- Security and privacy.
- Network design issues: bitrate; power; etc.

My Project



Big Picture Goal: Construct a citywide wireless mesh that uses cars to transfer data between access points.

My Project

Near Future Goal: Explore the feasability of such meshes.

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  - Performance of various mesh strategies.
  - Etc.

The Question Before Us

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A Sampling of Existing VANET "Theory"

C. Lochert, B. Sheuermann, M. Mauve. **Probabilistic Aggregation for Data Dissemination in VANETs.** VANET, 2007.

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Problem: How do we build an efficient system for aggregating observations in a VANET (e.g., free parking spaces or traffic density).

Solution: Use *Flajolet-Martin* sketches for simple, duplication insensitive, probabilistic approximations.

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- Can merge with bitwise-or.

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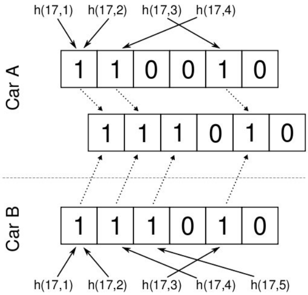

Figure 1: Generation and merging of FM sketch aggregates.

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