Proxy Based Authentication Localized Mobility Support Using IPv6 in VANET

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Abstract: *This* paper includes the major existing approaches and proposes a novel architecture to support mobile networks in network-based localized mobility domains. This architecture enables connectivity between two portable mobile devices from their existing locations. The objective of this approach is to provide real time alerts to vehicles in public transportation systems while also enabling better internet functionalities on these mobile devices. Another advantage of this approach, as opposed to the existing systems, is the functionality provided to IP devices that lack these functionalities. We also performed an experimental evaluation of our proposal that shows that our architecture improves the quality perceived by the end users.

Keywords— Ad hoc Network, Road Side Units, IVC, Intelligent Transport Systems (ITS)

1. Introduction

Vehicular ad-hoc networks known as VANETs have two major communication features. The communications can be classified in to two types.

1. Inter Vehicular Communication, also known as Vehicle to Vehicle communication (V2V), is used for transmitting information among vehicles present in the network.
In this form of communication there is no inter mediate infrastructure involved for communication between vehicles.

2. Vehicle to Infrastructure Communication (V2I) is used for transmitting information from the vehicle in the network to the corresponding infrastructure which it is associated to.

In vehicular networks, vehicles equipped with on board units (OBU) to enable the communication with other vehicles.

Car2Car communication consortium includes all these terminologies which are reliable and fast. Vehicle to infrastructure (V2I) approach has a wider range for communication.Vehicle to roadside (V2R) approach is used to communicate with roadside unit to broadcast the message to and from vehicles.

2. Review of RELATED LITERATURE

There have been various approaches made to evaluate and implement VANET systems. However, most of these have hit a roadblock in terms of making a groundbreaking application. Some of the existing researches and their notable drawbacks can be summarized accordingly.

1. The De-merit of Measurement and analysis of wireless impairments in DSRC vehicular communications by author Wanbing Tang; Laberteaux K; Bahai, is that it does not gives accurate prediction of traffic condition.

2. The research paper Vehicle to vehicle channels: Are we done yet by Matolak D.W. has De-merit of time delay to measure v2v channel.

3. Doubly selective vehicle to vehicle channel measurements and modelling at 5.9GHz by Guillermo AcostamarumMary Ann, Ingram also has flaw that measurement is not accurate in intelligent transportation application.

3. SYSTEM ARCHITECTURE

As per our design architecture which we are proposing we have following aims

1. Vehicle registration in network
2. Vehicle identification in network
3. Base station vehicle communication
4. Vehicle base station communication
5. Vehicle to vehicle communication
6. Effective routing of packets to achieve on time

Delivery of message

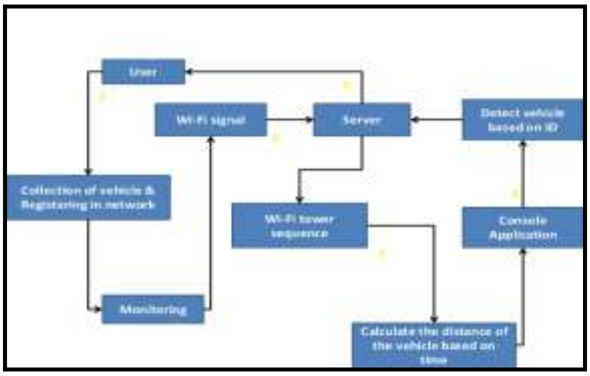


FIG 1. SYSTEM ARCHITECTURE

Modules.

User:
User can use his account to access information. He will be able to communicate with his car and the succeeding cars. He can broadcast messages over the network to notify the devices subscribed to the network.

Console Application:
The console application is the interface provided to the user to send and receive messages and other functionalities. The console application is present on the On Board Unit (OBU).

Road Site Unit:
The Road side unit (RSU) collects data from the OBU from vehicles. It enables communication between two OBUs. It also sends and receives data from the Server and transmits it to the OBUs.

Server:
The duty of the server is to act as a mediator between the cars. It also has the duty to facilitate the broadcasting of messages over a network. It also keeps track of all the devices and activities on the network.

Database:
The Database can be used to store all the log files and details of the Vehicles and devices connected to the network. The various updates that are posted are also stored in the database.

3.1 Algorithm

a. SA Algorithm

Simulated annealing (SA) is a metaheuristic algorithm for locating a good estimate to the global best possible solution of a given function in a large search space [8].
When the search space is distinct it is used.

```
s ← s0; e ← E(s)
sbest ← s; ebest ← e
k ← 0
while k <kmax and e >emax
T ← temperature (k/kmax)
snew ← neighbor(s)
enew ← E(snew)
if P(e, enew, T) > random() then
s ← snew; e ← enew
ifenew<ebest then
sbest ← snew; ebest ← enew
k ← k + 1
returnsbest
```

b. PSO Algorithm

```
initialize Swarm ( )
identify and represent best particle as the leader
whilee < max generation or Terminating condition ( ) do
foreach position of particle ( xe
i) do
update velocity of particle (ve
i)
update position of particle (xe
i)
evaluate (xe
i)
update best path (pe
i)
end for
update Leader (be)
```

end while

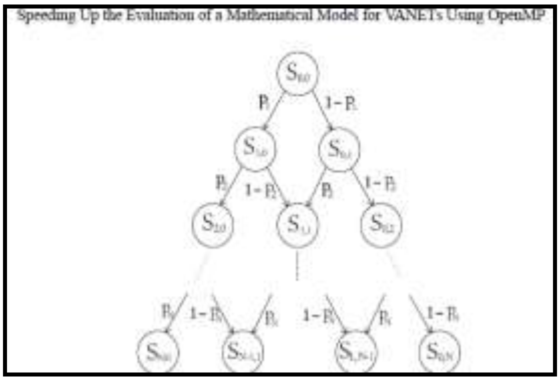
Particle swarm optimization (PSO) is a inhabitants based stochastic optimization method stimulated by social behavior of fish schooling and bird flocking [6].

c. Customized Algorithm

```
P – initialize population
initialize (T) traffic
S– generate solution( )
evaluate (S), (P)
while g< max generation or stop condition( )
do
S’  – Selection (S)
S’  – neighbor solution (N(S))
if ( f(S’ ) < f(S) then
S S’  // S’  replace as current solution
else
accept S’  as current solution with a probabilityprob (T,P,S,S’ )
end if
update (P)
end while
```

4. Mathematical model

We are interested in evaluating the performance of a CCA application for a chain of*N vehicles when the technology penetration rate is not 100%. We consider the* inter-vehiclespacing is normally distributed and each vehicle *Ci, i 2 {1, ...,N}, moves at* constant velocity *Vi.* Vehicles drive in convoy *(see Figure 1), reacting to the first collision* of another car, *C0,* according to two possible schemes: starting to brake because of a previously received warning message transmitted by a collided vehicle (if the vehicle is equipped with CCA technology) or starting to decelerate after noticing a reduction in the speed of the vehicle immediately ahead (if the vehicle under consideration is not equipped with CCA technology).With this model the final outcome of a vehicle depends on the outcome of the preceding vehicles. Therefore, the collision model is based on the construction of the following probability tree. We consider an initial state in which no vehicle has collided



We start calculating the collision probability of the nearest to the incidence vehicle, *C1*. The position of Ci when it starts to decelerate is normally distributed with mean $\mu i =-i \ d$ and standard deviation $s = d/2$, where d is the average inter-vehicle distance. Vehicle C1 will collide if and only if the distance to C0 is less than the distance that it needs to stop, Ds, so its collision probability is given by:

$$p1 = 1-Z -L-Ds$$
$$-¥$$
$$f (x;\mu1,s)\ dx\ , (1)$$

This average position is determined by:

$$X1 = Z -L$$
$$-¥$$
$$x \cdot f (x;\mu1+Ds,s)\ dx + (-L) \cdot Z +¥$$
$$-L$$
$$f (x;\mu1+Ds,s)\ dx\ . (2)$$
$$pi = 1-Z\ Xi-1-L-Ds$$
$$-¥$$
$$f (x;\mu i,s)\ dx,\ i = 2, . . . ,N\ , (3)$$

where

$$Xi =Z\ Xi-1-L$$
$$-¥$$
$$x\cdot f (x;\mu i+Ds,s)\ dx + (Xi-1-L)\cdot Z +¥$$
$$Xi-1-L$$
$$f (x;\mu i+Ds,s)\ dx,\ i=2, . . . ,N\ .$$

5. CONCLUSION

The primary motive is to implement efficient and safer roads through inculcation of vehicular networks by involving the basic authorities and drivers in time. Another target is to explore the possibilities in the advancement of vehicular ad hoc networking (VANET) wireless technologies. The purpose is to provide secure commercial requests and messages through range of communication systems and/or other networks (VANET) which goes short to medium.

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