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JOURNAL AND OTHER ARTICLES

- Schemenner, R.W., Huber, J.C. and Cook, R.L. (1987), "Geographic Differences and the Location of New Manufacturing Facilities," Journal of Urban Economics, Vol. 21, No. 1, pp. 83-104.

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THE INFLUENCE OF INTELLIGENT TRANSPORTATION SPACES IN INTELLIGENT TRANSPORTATION SYSTEM

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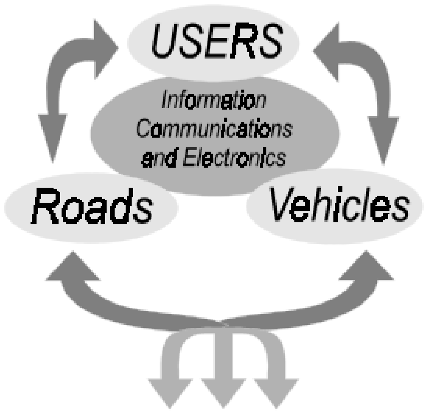
ABSTRACT
In the recent years, we have been witnessing many breakthroughs in computing, sensing, electronics, control, signal processing and robotics. This has made many advancements in increased the state of Intelligent Transportation System (ITS) and its applications. Intelligent Transportation Space (ITSp) was first developed to improve the safety in handling vehicles, traffic and transportation more efficiently and effectively. ITSp not only combines the ITS modules but also the roadside management, pedestrians, traffic control units, sensors and satellites. ITSp is distributed and pervasive in nature. So, it forces to follow a strong build through to communicate with all the modules of ITS for information exchange. With high mobility of vehicles and high variable network topology, the communication regarding availability of information, timeliness and reliability is not an easy task and thus it is a big challenge for implementing it. So, our paper proposes a new concept of ITSp and analyses the possible communication technologies.

KEYWORDS
ITS, ITSp, CPS, CPSS, Wireless Technologies, Intra-vehicle Technologies, WAVE.

INTRODUCTION
The very first automobile was invented in 1885. Since then, the world has been keen in developing various technologies for vehicle safety, traffic and transportation for comfort ability, efficiency and eco-friendly. But, the existing programs or systems are not satisfactory to the mark. This has made all the countries to face more number of road accidents keep increasing every year.

Intelligent Transportation Systems (ITS) paves way for many technologies in multiple disciplines in order to improve the poor transportation system. This increases providing traffic information, reduces loads for driving, and enhances route management. All over the world, almost all the countries have implemented ITS for the purpose of Automatic Toll Collection, Safely Instructions Displaying, Controlling Traffic Management, Avoiding Collision, etc., Of all these, each ITS module has different mechanisms.

FIG. 1: ITS CONCEPTUAL MODEL



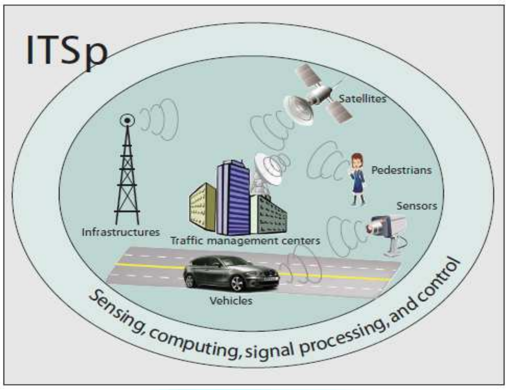
To explain with an example, the ITS module of which the collision avoidance collects information of adjacent vehicles by using optical or microwave sensors and also listens to other vehicles broadcast. And finally, it reacts to send warning messages to the pilot or driver before the collision takes place.

There are a number of ITS modules that are adopted in vehicles, road infrastructure and in traffic control management to improve various aspects for better transportation. Many ITS modules provide better solutions for effective transportation management system. But, their abundance in nature incurs other problems. Independent designed ITS modules could conflict with other ITS modules aspects in terms of communication frequency bands, voice indication, power transmission, and so on.

Intelligent Transportation Spaces (ITSp), as a term, was first coined in the year 1999 and this has been studied in this paper in later part. The main function of this concept is to integrate various available modules of ITS and its participants and devices with pervasive and distributed intelligence.

The transportation devices may be pedestrians, vehicles, road infrastructure, traffic control centres, satellites, sensors, etc., ITSp benefitted from researches related to cyber-physical (CPS) and cyber-physical social system (CPSS). ITSp not only solves issues in independent ITS modules by integrated design, but also maximizes the sharing resources among various applications.

FIG 2: SYSTEM DESIGN OF ITSp INTEGRATION IN VARIOUS ITS MODULES AND TECHNOLOGIES



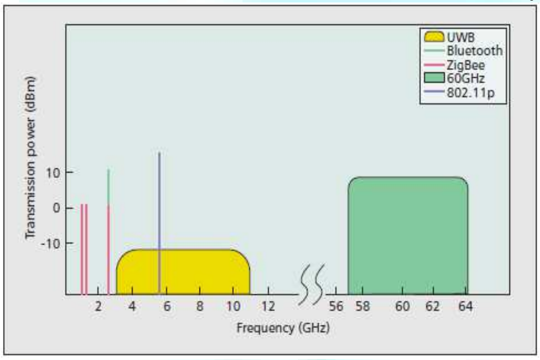
The actualization of ITSp is a challenging task to accomplish when it comes to information sharing between the nodes in a network. The first thing is that the information should be available anywhere within the network with an acceptable delay. The second thing is, each nodes should be able to manage the shared information with an exceptional intelligence.

ITSp Communications has its own limitations. The exchanging information can be separated into Safety-related and Non-safety related messages. The character of vehicles like high mobility and distance pave way for new issues in established communication networked links in ITSp. In this paper, let us study and elaborate the possible communication technologies for ITSp over wireless networks.

COMMUNICATIONS INSIDE VEHICLES

The development of vehicle network has led to a drastic increase in connecting number of cables within a vehicle. These cables can take upto 50kg of vehicle weight. Their accessory components embed and all over the vehicle body will be more cost effective and have difficulties in installing and maintaining. So, the wireless technology for automobile was first invented and it becomes a natural and permanent solution thereafter. Wireless links based on Bluetooth Technology corresponding to IEEE 802.15.1 was proposed and replaced cables about 15 years ago. Wireless links are flexible and economical when there is an alteration in their counterpart. But, a fully wireless vehicle bus system is still away from reality. This is only because each link may have its own requirements. And so, Bluetooth has not become the universal solution. ITSp in an intra-vehicular environment expects more wireless links connecting different ITS modules, devices and sensors for transfer of information, control and safety with varying data rate, delay, and reliability. Thus, the existence of multiple wireless communication technologies was set into action to meet all these requirements. Data rate is the most important aspect for the success in network communication.

FIG. 3: POSSIBLE COMMUNICATION TECHNOLOGIES FOR ITSp



ITSp Wireless Technologies for Intra-Vehicle Links is divided into two main categories.

1. Low Rate Intra-Vehicle Links
2. High Rate Intra-Vehicle Links

LOW RATE INTRA-VEHICLE LINKS

Low rate intra vehicle links are sufficient enough for more sensors inside vehicles. This is because sensors require a throughput of not more than 12 kb per second. For example, for temperature and fuel level required only a low data rate of just 1Mb per second or less.

BLUETOOTH

Bluetooth is a good solution for wireless technology for low rate intra-vehicle ITSp links. There are a number of Bluetooth-enabled applications available in the market already. Bluetooth GPS is most widely used a few years ago when smart phones and personal digital assistants (PDA's) does not exist. As we know, how popular the Bluetooth hands-free mobile phone kits and Bluetooth music players are popular in the market today.

FIG 4: COMPARISON CHART BETWEEN BLUETOOTH AND ZIGBEE

Characteristic	Bluetooth	ZigBee
IEEE spec.	802.15.1	802.15.4
Operating frequency	2.4 GHz ISM	868 MHz, 902–928 MHz, 2.4 GHz ISM
Data rate	1 Mb/s	20–250 kb/s
Nominal TX power	0–10 dBm	–25–0 dBm
Nominal range	10–100 m	10–75 m
Max # of cell nodes	8	65,000

However, Bluetooth ITSp applications are not without issues. The transmission power of a Bluetooth node is 0-10dBm which is high for battery device for continual operation. So, the wake time for these nodes is about 3 seconds. To meet this delay, intra-vehicle Bluetooth nodes are not allowed to sleep much. There are some Bluetooth nodes that can be powered by automobile battery itself but there are many that still rely on device embedded batteries. So, additional power cord will offset the benefits of wireless completely. High power consumption with limited sleep time can deplete the battery in few hours. Another aspect is multiple access capability. The limitation of 8 nodes is a bottleneck as many sensors are connected to one board or network computer.

ZIGBEE

Another technology for intra-vehicle ITSp wireless links is **ZigBee**. Comparison chart between Bluetooth and ZigBee is given in below figure. The 2.4GHz Industrial, Scientific and Medical band (ISM Band), Bluetooth and ZigBee shall operate on two additional bands called 868MHz and 902-928MHz that provides more flexibility. ZigBee allows more than 65,000 nodes in a single network than Bluetooth. When compared with Bluetooth, ZigBee's transmission power is -25-0dBm which is higher in Bluetooth. So, ZigBee is designed in such a way that it may run for more than six months to two years on just 2 AA Batteries.

INTRA-VEHICLE WIRELESS CHANNEL FOR LOW RATE COMMUNICATIONS

We could not find more researches for low rate intra-vehicle communication other than Bluetooth and Zigbee. The need for development of ITSp keep arising as the wireless communication technologies and its channel characteristics are critical in nature. The intra vehicle model is quite different as the vehicle is a reflective environment which reflections absorbed due to the presence of seats and plastic. Hence, the existing indoor channel models cannot be directly applied. Extensive research on such wireless channel is necessary for future developments.

HIGH RATE INTRA VEHICLE LINKS

With the arrival of many ITS modules, more number of intra-vehicle applications requires wireless links with high data rates on 100s of Mb per second. High data rate intra vehicle links is the necessary enabler for data transportation in distributed artificial intelligence. Let us discuss some of the wireless technologies in this domain.

ULTRA-WIDEBAND TECHNOLOGY

The huge spectrum of **Ultra Wideband (UWD) 31.-10.6 GHz** supports communications for high data rate upto 480 Mb per second at a very small distance of 10-15m at low power. There are two main different specifications available for UWB module in IEEE 802.15.3a.

1. Impulse Radio Ultra Wideband (IR-UWB)
2. Multi Band Ultra Wideband (MB-UWB)

Both IR and MB systems are designed for indoor channels with long delay of spread that are also common in intra-vehicle systems.

In addition, UWB has much other uniqueness such as

i) Enhanced Capability
ii) Penetrates Obstacles
iii) Localizing Precision down to centimeter level
iv) Very high data rates
v) High user capacity
vi) Small latency
vii) Small device size and
viii) Low processing power

These advantages have made the door open for developers for developing high data rate applications in ITSp. But still, there requires an extensive research for intra-vehicle UWB as the UWB systems are customized in designs and used for inside the building environments.

Researches on media access control (MAC) sublayer have been carried out for intra-vehicle UWB. Media Access Control plays an important role in throughput and for ITSp delay. IEEE MAC sublayer proposes 802.15.3a takes the Carrier Sense Multiple Access Collision Avoidance (CSMA/CA) technique may cause a short delay. Hence, real time MAC protocols for intra-vehicle UWB is an emerging and hot research area in networking.

60 GHz MILLIMETER WAVE TECHNOLOGY

Millimeter Wave at 60GHz ISM band is another promising technology for high data rate intra-vehicle wireless connections. These waves attenuate rapidly in air and hardly penetrate the obstacles for short range wireless transmissions in a personal area network (PAN). For example, IEEE 802.15.3c and indoor wireless local area networks (LANs).

COMMUNICATIONS FOR VEHICLES, TRAFFIC AND BEYOND

The communications among roadside infrastructure, traffic control locations and other stationary nodes are fixed at locations can be easily achieved with existing technologies (eg. Optical Fibre). It is a challenging task in ITSp that vehicle to vehicle (V2V) and vehicle to infrastructure (V2I) communications. We have to handle double selective fading channels in both delay and Doppler domains, maximum latency allowance and reliability issues. To overcome these issues, V2V and V2I communication methods includes existing technologies actually designed for wireless network scenarios.

EXISTING TECHNOLOGIES

There are 4 main technologies mainly used for intra vehicle ITSp namely,

1. Bluetooth
2. ZigBee
3. UWB and
4. Millimeter Wave Communications.

But, things are quite different for V2V and V2I communication scenario. Basically, these technologies for indoor or PAN are not designed for Doppler introduced by moving vehicles. Next, the transmission range of these technologies does not meet the requirement of V2V and V2I scenarios.

Transmission ranges for Bluetooth, ZigBee and UWB are below 100m, normally it is 10m. In V2V cases, short transmission range means high vehicle density that may not meet on highway or rural areas. In V2I, short transmission range implies more roadside infrastructures and therefore increases cost of the overall system. Thirdly, the millimeter wave communications are specifically designed for line of sight (LoS) links that are unavailable in many V2V and V2I scenarios. So, these applications are limited only to some special environments.

VEHICULAR ENVIRONMENT WIRELESS ACCESS

To overcome the existing challenges in providing reliable links for ITSp, a new V2V and V2I technologies are must to develop. The Intelligent Transportation Society of America recommends single standard for Physical Layer (PHY) and MAC and proposes IEEE 802.111. The IEEE 802.11p and IEEE 1609.x together composed the so-called wireless access in vehicular environments (WAVE) standards.

PHY

The IEEE 802.11p design makes minimum changes to IEEE 802.11a OFDM PHY, so that WAVE devices can communicate effectively among fast moving vehicles in roadway environments. The reason to develop IEEE 802.11p that is based on IEEE 802.11a is a standard, stable and mature that has been implemented in real applications for years and has strong industry support.

To cope with long delay spread in V2V and V2I cases, IEEE 802.11p PHY uses 10MHz bandwidth inspite of 20MHz used by IEEE 802.11a. Thus, the implementation of this change is straight forward as it mainly involves doubling all OFDM timing parameters in 20MHz IEEE 802.11a systems. The IEEE 802.11p PHY has an operation range of upto 1000m, exceeded IEEE 802.11a. Thus it provides data rates from 2Mb per second with BPSK to 27Mb per second with 64 QAM. This relativity range guarantees V2V connections in urban and rural scenarios with different vehicle densities ad avoids constructing a large number of roadside infrastructures.

MAC

The IEEE 802.11p MAC is also based on that of IEEE 802.11a. Here, an access point (AP) sends beacons periodically as an advertisement. The node first hears to beacons and joins the basic service set (BSS) through a number of interactive steps.

But, vehicles with high mobility on road for the node to join BSS in IEEE 802.11a become unaffordable for V2V and V2I cases. IEEE 802.11p MAC addresses this problem effectively. The WAVE station does not send beacon periodically but uses an on-demand beacon that has all information for receiver to decide whether to join. The result is, a node can join WAVE BSS in just a single step that fulfills the quick networking setup requirement in vehicular ad-hoc networks called VANETs. These VANETs provide many applications in ITSp such as information sharing, collision avoidance and platoon autonomous driving. As a result, despite the extensive research work, V2V and V2I MAC remains an intriguing topic requiring considerable research efforts.

CONCLUSION

ITSp are intelligent spaces integrating multiple ITS modules as well as participants and devices in transportation. Having the interlaced cyber, physical and social aspects, ITSp are expected to provide safety and comfort to another level.

To realize the distributed and pervasive intelligence of ITSp, communications and networking are clearly the key enablers. This paper discusses on the potential wireless communication technologies for ITSp. We presented a number of currently developed technologies that have some suitable characteristics for ITSp and illustrated some state-of-the-art of some technologies under development.

From all these discussions, it is clear that one technology fits some certain applications and it s envisioned that ITSp will adopt multiple communication technologies and standards. In this article, we mainly focused on layer issues of wireless communication technologies including transmission power, bandwidth, data rate, device wakeup latency, and MAC latency.

The realization of ITSp is challenging, time-consuming and effort taking. However, one does not have to wait till its full realization to benefit from ITSp. The current ITS can be regarded as a series of independent small scale ITSp that fulfill some specific needs of the system. Hence, the concept of ITSp, where all participants in transportation are connected and managed by intelligent nodes, and enlightens the design of future personal devices vehicles, roads, and transportation systems and other cyber-physical-social systems.

REFERENCES

1. Fei-Yue Wang, “Parallel Control and Management for Intelligent Transportation System”, IEEE Transactions on Intelligent Transportation Systems, Volume 11, Issue 3, 2010.
2. “Intelligent Transportation System (ITS): Research and Applications”, Society of Automotive Engineers, inc, SP-1467, August 1999.
3. Lino Figueiredo, Isabel Jesus, J.A.Tenreiro Machado, Jose Rui Ferreira, J.L.Martins de Carvalho, “Towards the Development of Intelligent Transportation Systems”, Paper ID Number 81, www.universelle-automation.de
4. Ralf Schleiffer, “Intelligent Agents in Traffic and Transportation”, Elsevier, Volume 10, Issue 5, 2002.
5. S.Ghosh and T.Lee, “Intelligent Transportation Systems – New Principles and Architectures”, CRC Press 2000.
6. Xu Bin, Chen Xiaohong, Lin Hangfei and Yang Chao, “Decision Oriented Intelligent Transport Information Platform Design Research-Case Study of Hangzhou City”, Procedia-Social and Behavioral Sciences, Volume 96, 2013
7. Y.Wang and H.Oi, “Research of Intelligent Transportation System Based on the Internet of Things Frame”, Wireless Engineering and Technology, Volume 3, Number 3, 2012, pp-160-166, doi: 10.4236/wet.2012.33023.

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