Internet Based Human Vehicle Interface

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Abstract
In the context of ubiquitous computing, the concept of a ubiquitous vehicle emerges as a multifunctional entity serving as both a means of ground transportation and a communication node within the vehicular network. This integration aims to establish seamless and remote connectivity between humans and vehicles. Among the various services offered by ubiquitous vehicles, vehicle teleoperation stands out as a prominent feature. However, to effectively provide vehicle teleoperation services, it necessitates a collaborative framework involving the in-vehicle communication network, the vehicle-to-vehicle communication network, and the vehicle-to-roadside communication network. This paper presents an Internet-based human-vehicle interface and a comprehensive network architecture that enables remote vehicle control and diagnosis services, thereby facilitating enhanced functionality and connectivity in the realm of ubiquitous vehicles.

Keywords*: Ubiquitous vehicle, Vehicle teleoperation, In-vehicle communication network, Vehicle-to-vehicle communication network, Vehicle-to-roadside communication network.*

INTRODUCTION

The Internet-Based Human-Vehicle Interface (HBVI) is an emerging technology that aims to enhance the interaction between humans and vehicles by leveraging the power of the internet and connectivity. It revolutionizes the traditional vehicle interface by providing advanced features, real-time data exchange, and seamless integration with various online services and platforms. The HBVI brings together the principles of human-computer interaction, internet connectivity, and vehicle systems to create a holistic and intelligent interface. It enables users to access a wide range of information and services, such as navigation, entertainment, communication, and vehicle diagnostics, through intuitive and user-friendly interfaces.

With the increasing prevalence of connected vehicles and the Internet of Things (IoT), the HBVI offers several benefits and possibilities. It allows drivers and passengers to stay connected and access personalized services while on the move. For example, drivers can use voice commands or touch screens to interact with their vehicles and control various functions, including climate control, music playback, and hands-free calling. Passengers can enjoy multimedia entertainment, connect their devices, and make use of online services during their journey. Moreover, the HBVI can provide real-time traffic updates, route recommendations, and integrate with external services such as weather forecasts and point-of-interest databases. This enables drivers to make informed decisions and optimize their travel experience. Additionally, the HBVI can enhance safety by integrating advanced driver assistance systems, such as collision warnings, lane departure alerts, and adaptive cruise control, into the interface.

Furthermore, the HBVI opens up opportunities for vehicle manufacturers, app developers, and service providers to create innovative and personalized experiences for users. By leveraging internet connectivity, vehicles can be updated with new features, performance enhancements, and security patches over-the-air. App developers can create applications and services specifically tailored for the HBVI, expanding the possibilities for entertainment, productivity, and convenience. However, the HBVI also presents challenges, such as ensuring data privacy, addressing cybersecurity concerns, and managing the complexity of integrating diverse systems and services. Nevertheless, the rapid advancements in connectivity, artificial intelligence, and user experience design continue to drive the development and adoption of the HBVI, making it a promising technology for the future of human-vehicle interaction. In summary, the Internet-Based Human-Vehicle Interface is a transformative technology that revolutionizes the way humans interact with vehicles. By leveraging internet connectivity, advanced interfaces, and integration with online services, the HBVI enhances convenience, safety, and personalization for users, while also opening up new possibilities for innovation and connectivity in the automotive industry.

LITERATURE SURVEY

The history of the Internet-Based Human-Vehicle Interface (HBVI) can be traced back to the advancements in both automotive technology and internet connectivity. Here is a brief overview of the key milestones in the development of the HBVI. Early Infotainment Systems (Late 1990s - Early 2000s): In the late 1990s and early 2000s, automotive manufacturers began incorporating infotainment systems into vehicles. These systems provided basic functionalities such as radio, CD players, and navigation. However, internet connectivity was limited or absent during this period.

Telematics and Connected Services (Mid-2000s): Telematics systems emerged in the mid-2000s, enabling the integration of telecommunications and vehicle monitoring. These systems allowed for features like remote diagnostics, emergency services, and stolen vehicle tracking. They laid the foundation for future internet-based connectivity in vehicles.

Emergence of Smartphone Integration (Late 2000s): The proliferation of smartphones brought new possibilities for connectivity in vehicles. Manufacturers began developing systems that could integrate smartphones with the vehicle's infotainment system. This integration enabled access to internet-based services like music streaming, navigation, and hands-free calling.

Early Internet Connectivity (2010s): In the early 2010s, vehicle manufacturers started incorporating internet connectivity directly into vehicles. This allowed for direct access to online services such as real-time traffic information, weather updates, and social media integration. These systems began to provide a more seamless and comprehensive internet-based experience.

Advanced Human-Vehicle Interaction (Mid-2010s): With the advancement of touchscreens, voice recognition, and gesture control, the human-vehicle interaction in infotainment systems improved significantly. These technologies enabled more intuitive and user-friendly interfaces, reducing driver distractions and enhancing the overall user experience.

Integration of Voice Assistants (Late 2010s - Present): Voice assistants like Amazon Alexa, Google Assistant, and Apple Siri have made their way into vehicles, allowing drivers to control various functions using voice commands. This integration has further enhanced the convenience and hands-free operation of internet-based services in vehicles.

Advancements in Connected Car Technology (Present): Currently, there is a strong focus on connected car technology, driven by the Internet of Things (IoT) and vehicle-to-everything (V2X) communication. Vehicle manufacturers are working towards developing comprehensive ecosystems that seamlessly connect vehicles with the internet, smart home devices, cloud services, and other vehicles on the road.

Future Developments: The future of the HBVI is likely to involve further integration with emerging technologies such as artificial intelligence (AI), augmented reality (AR), and 5G connectivity. These advancements will enable more sophisticated features, including personalized recommendations, predictive maintenance, and enhanced safety systems.
It is important to note that the specific timeline and milestones may vary among different vehicle manufacturers and technological advancements. However, the overall trend has been towards increasing connectivity and enhancing the human-vehicle interface through internet based technologies.

PROPOSED SYSTEM

The internet of things (IoT) is the system of physical gadgets, vehicles, structures, and different things embedded with electronics, software, sensors, actuators, and network connectivity that empower these articles to gather and trade information. In 2013 the Global Standards Initiative on the Internet of Things (IoT-GSI) characterized the IoT as " the framework of the data society. The IoT enables items to be detected and controlled remotely crosswise over existing system infrastructure, creating open doors for more straightforward joining of the physical world into PC based frameworks and bringing about improved effectiveness, precision, and financial advantage. When IoT is enlarged with sensors and actuators, the innovation turns into an occurrence of the broader class of cyber physical frameworks, which likewise includes advancements such as smart grids, smart homes, intelligent transportation, and smart urban areas. With the consistently developing innovative headway, human progress is searching for computerization in each circle of life. Robotized vehicle is probably the most recent pattern which has been greatly perceived by individuals all around the globe as they need greatest security and solace during driving.
These days, the street mishap is one of the prime worries for individuals. It moved toward becoming very visit and questionable. The vast majority of the street mishap happens because of an absence of abidance of traffic rules. More often than not, the drivers become lazy or diverted during driving and inevitably hit items in front of them. In the event that the driving procedure can be taken care of with the guide of Computer Vision and proficient sensors then the danger of human errors can be profoundly decreased. Also, some of the time it gets important to get to the vehicle from a remote area so as to diminish bothers. For this situation, it would be much progressively advantageous if the vehicle could be seen from a remote PC and driven by communication through the PC console. This could be as simple as playing a PC game. Our work depends on the Internet of Things innovation and Computer Vision to control the portable utilization of our vehicle and robotization highlights. These gadgets, or things, interface with the system to give the data they accumulate from the

earth through sensors, or to enable different frameworks to connect and follow up on the world through actuators. They could be associated renditions of normal articles you may as of now be comfortable with, or new and reason assembled gadgets for capacities not yet figured it out. They could be gadgets that you claim by and by and convey with you or keep in your home, or they could be implanted in industrial facility hardware, or part of the texture of the city you live in. Every one of them can change over important data from this present reality into computerized information that gives expanded perceivability into how your clients connect with your items, administrations, or applications.

Network-oriented server-client model, where the server is separated from the vehicle. This network model can support the mobile services of vehicles more easily because it allows a vehicle driver to have access to the Internet via a mobile network such as a cellular network or wireless local area network (WLAN). In addition, web users can get remote vehicle management services by using a web browser at anytime and anywhere. Moreover, it does not require high performance car PC. existing system and disadvantages are Therefore, it puts limitation on the extension of vehicle services. Do not support the connection with the external network such as Internet In the ubiquitous computing environment, a ubiquitous vehicle will be a communication node in the vehicular network as well as the means of ground transportation. Especially, one of the prominent services in the ubiquitous vehicle is the vehicle tele-operation. However, mutual-collaboration with the in-vehicle communication network, the vehicle-to-vehicle communication network and the vehicle-to-roadside communication network is required to provide vehicle teleoperation services. In this paper, an Internet-based human-vehicle interfaces and a network architecture are presented to provide remote vehicle control and diagnosis services.

Results

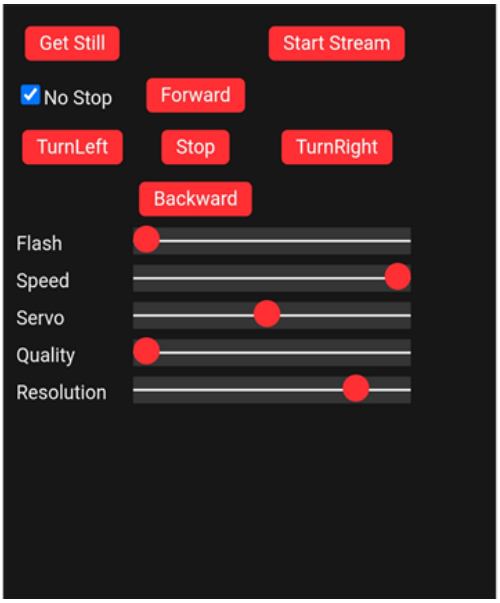

Fig 1 Homepage

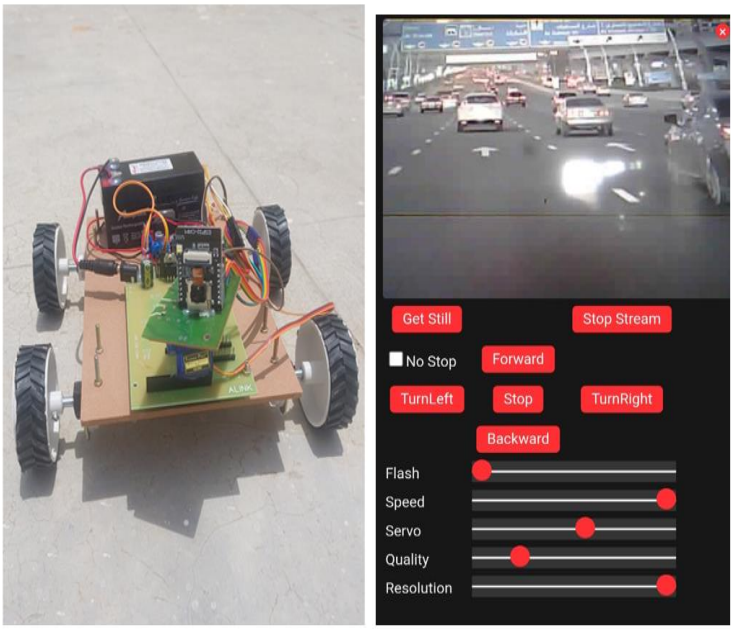

Fig 2. Streaming

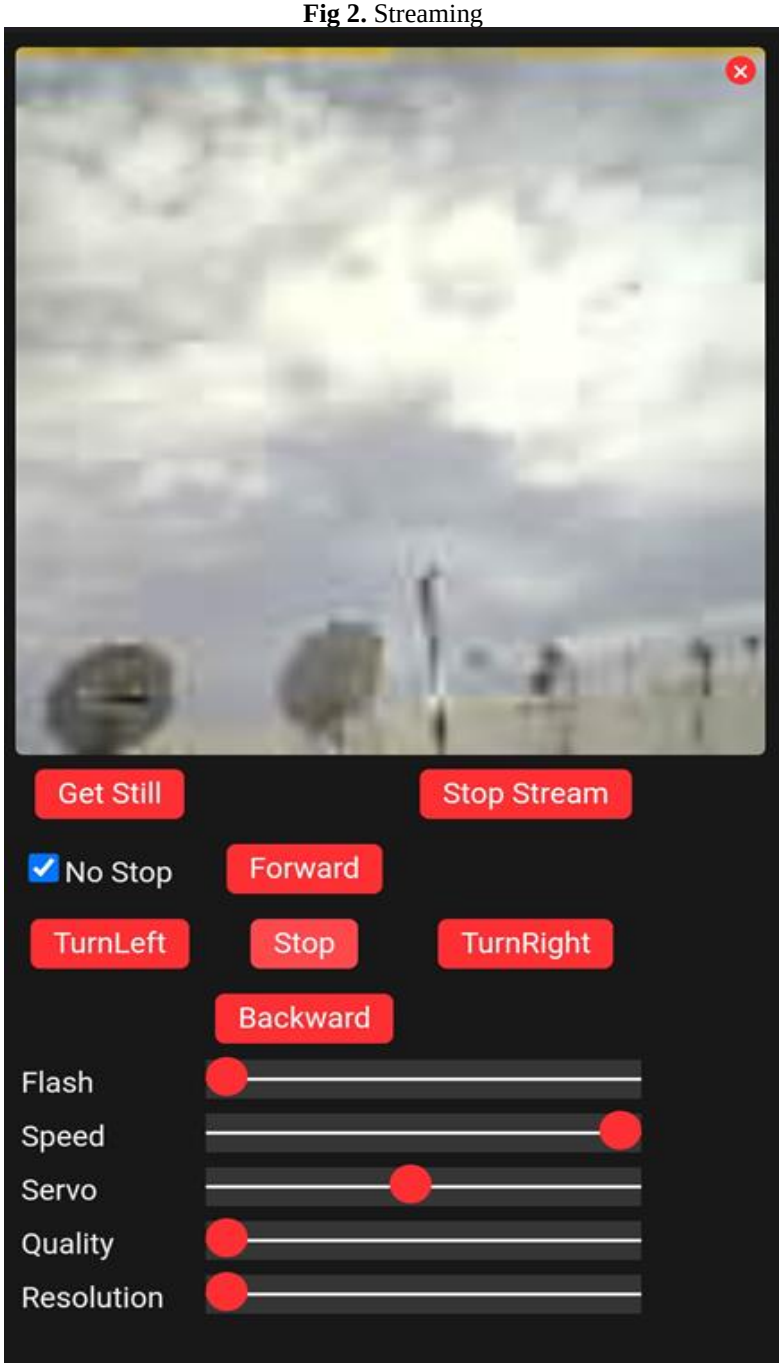

Fig 2 Quality high Resolution low

ADVANTAGES

- It will make humans and vehicles seamlessly and remotely connected.
- Ubiquitous computing environment connection is created between user and vehicle.

CONCLUSION

In conclusion, the integration of Internet of Things (IoT) technologies with human vehicle interfaces has paved the way for significant advancements in the automotive industry. Internet-based human vehicle interfaces offer a wide range of benefits, including remote control, real-time monitoring, enhanced safety, improved user experience, and innovative applications. Throughout this paper, we have explored the various aspects of internet-based human vehicle interfaces within the IoT context. The development and implementation of hardware systems have played a crucial role in enabling internet connectivity and data acquisition in vehicles. Embedded systems, microcontrollers, and communication modules have facilitated seamless integration with IoT networks, allowing vehicles to communicate and exchange data with other devices and platforms. Software development and system architecture have been pivotal in creating web servers, mobile applications, and over-the-air update mechanisms for remote vehicle control and monitoring. These advancements have empowered users to interact with their vehicles through intuitive interfaces and access real-time information about their vehicles' status and performance. Communication and security considerations have been paramount in ensuring secure

and reliable data transmission in internet-connected vehicles. Wireless communication protocols, encryption techniques, and access control mechanisms have been deployed to protect the privacy and integrity of the data exchanged between vehicles and external systems. The user experience and human factors have been critical aspects in designing interfaces that are intuitive, user-friendly, and context-aware. By considering human-machine interactions, user studies, and feedback, developers have strived to create interfaces that enhance the overall driving experience and meet users' needs and expectations.

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