# Chapter 6
# Blockchain–Autonomous Driving Systems

**P. Lalitha Surya Kumari**

https://orcid.org/0000-0003-3611-8038

*Koneru Lakshmaiah University, Hyderabad, India*

## ABSTRACT

*Blockchain is the upcoming new information technology that could have quite a lot of significant future applications. In this chapter, the communication network for the reliable environment of intelligent vehicle systems is considered along with how the blockchain technology generates trust network among intelligent vehicles. It also discusses different factors that are effecting or motivating automotive industry, data-driven intelligent transportation system (D2ITS), structure of VANET, framework of intelligent vehicle data sharing based on blockchain used for intelligent vehicle communication and decentralized autonomous vehicles (DAV) network. It also talks about the different ways the autonomous vehicles use blockchain. Block-VN distributed architecture is discussed in detail. The different challenges of research and privacy and security of vehicular network are discussed.*

## I. INTRODUCTION

Blockchain is the upcoming new information technology that could have quite a lot of significant future applications. One is blockchain thinking, formulating thinking as a blockchain process. This could have advantages for both human enhancement and artificial intelligence, and their potential integration. Blockchain thinking is given as an input-processing-output computational system. Its benefits may include the capability to organize digital mind file uploads, supporter for digital intelligences for upcoming timeframes, execute utility functions based on smart-contracts, instantiate thinking as a power law, and make possible to act as friendly AI.

The automotive industry might face numerous comprehensive and interlinked changes in the subsequent decades. The automotive industry has an advantage to improve efficiently through the Internet and technology, but has mainly remained in the same structure in contrast to reorganize its whole ecosystem. Re-conceptualization of core activity must be organized, coordinated, and executed.

Many factors like growing aging and urban populations, automotive 3D printing of spare parts, the introduction of self-driving cars, new models for delivery of transportation services and energy innovation could drive the automotive industry into new configurations, possibly towards innovative concepts that are depicted in Fig.1 of an highly developed biopod personal transport system.

*Figure 1. The BioThink Advanced Vehicle for Metropolitan Cities (BioThink Futuristic Vehicle for Mega-Cities, 2015, Muhammad ElMahdy, 2015). The different factors that are affecting automotive industry are*



## a. Demographics: Growing Aging and Urbanized Populations

The world population continues to increase, and is expected to grow up to 9.6 billion in 2050. Not only is the population increasing but also the urbanization; for the past ten years more than half of the world's population has been residing in cities, and this trend may continue and expected more than 5 billion people to live in urban areas in 2030 (United Nations. Urbanization, 2007) The further main worldwide demographic tendency is the aging of populations where we required different types of personalized transportation solutions (United Nations: Current status of the social situation, well-being, participation in development and rights of older persons worldwide. United Nations Department of Economic and Social Affairs, 2012) . Similarly, number of cars and autos on the road is also increasing year by year. Increased urbanization and more cars on the road leads to traffic congestion;

## b. Self-Driving Vehicles

Self-driving vehicles are the one of influencing factors to increase autonomy and self-operation capabilities like the ability to sense the environment and navigate with no human inputs. The progression in the development of vehicles is from advanced driver support systems to semi-autonomous systems, to fully autonomous systems. The first vehicle with some self-driving capability is expected to come into the market by 2020. From industry point of view, there must be large and systematic potential factors required for transitioning of self-driving fleets. The regulatory stance of governments will also be crucial, and likewise the corresponding insurance, licensing, regulatory, and financing models.

## Related Content

Review of Link Structure Based Ranking Algorithms and Hanging Pages

Ravi P. Kumar, Ashutosh K. Singhand Anand Mohan (2016). *Handbook of Research on Modern Cryptographic Solutions for Computer and Cyber Security (pp. 420-459).*

www.irma-international.org/chapter/review-of-link-structure-based-ranking-algorithms-and-hanging-pages/153086

The Quadratic Sieve Algorithm for Integer Factoring

Kannan Balasubramanianand M. Rajakani (2018). *Algorithmic Strategies for Solving Complex Problems in Cryptography (pp. 241-252).*

www.irma-international.org/chapter/the-quadratic-sieve-algorithm-for-integer-factoring/188526

Quantum Internet and E-Governance: A Futuristic Perspective

Manan Dhaneshbhai Thakkarand Rakesh D. Vanzara (2020). *Quantum Cryptography and the Future of Cyber Security (pp. 109-132).*

www.irma-international.org/chapter/quantum-internet-and-e-governance/248154

Video Saliency Detection for Visual Cryptography-Based Watermarking

Adrita Barariand Sunita V. Dhavale (2020). *Cryptography: Breakthroughs in Research and Practice (pp. 498-536).*

www.irma-international.org/chapter/video-saliency-detection-for-visual-cryptography-based-watermarking/244935

A Contemplator on Topical Image Encryption Measures

Jayanta Mondaland Debabala Swain (2020). *Cryptography: Breakthroughs in Research and Practice (pp. 556-573).*

www.irma-international.org/chapter/a-contemplator-on-topical-image-encryption-measures/244938