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On Building Users' Initial Trust in Autonomous Vehicles

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Abstract

With a high degree of uncertainty, taxi service companies begin incorporating autonomous vehicles in their transportation services. The authors examine the factors that influence users' initial trust in autonomous vehicles. They extend the initial trust model and validate the model in the context of an emerging technology. The initial trust model examines the influence of trust base factors (representing cognitive, personality, calculative, and institutional categories) and subjective norms on trusting beliefs, trusting attitude, and trusting intention. Findings indicate that faith in intelligent machines, calculative cost/benefit perception, perceived societal benefits, organizational situation normality, and technology structural assurance are potential indicators of users' trusting beliefs in this context. The paper contributes to the theory and practice by extending the initial trust model and examining trusting factors in the context of an emerging technology that requires understanding users' mentality before launching autonomous vehicles on a wide scale.

Keywords: initial trust; autonomous vehicles; technology acceptance; transportation service

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1. Introduction

There is rapid progress in the development of autonomous vehicles, such as autonomous taxis. Demand-response taxi services are an efficient transportation system [14], and autonomous taxis show the trend to lead the industry [16]. Many companies including Ford, General Motors, Zoox, Aptiv, and Waymo are developing and testing autonomous vehicles [11]. Many leading companies like Uber and Lyft are advancing the commercialization of

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autonomous vehicles [16]. In 2016 Uber and Volvo Cars agreed to spend 300 million USD towards the development of fully autonomous vehicles that could be added to their services by 2021 [2]. Some companies like Uber, nuTonomy, and Waymo, have already started using autonomous vehicles for their taxi service in different cities across the world [2], [14]. Today, autonomous vehicles still have technical limitations, for instance, being unable to anticipate rare traffic situations [6], [10]. As an emerging technology, users' expectations for autonomous vehicles are rising, but the companies are not ready to reallocate resources to respond. The National Highway Traffic Safety Administration does not expect the adoption of fully automated vehicles before 2025 [14], the question of trust is likely to play a critical role in both the development of government policies and regulations and corporate decisions to invest in the production of fully autonomous vehicles and marketing them as such. It raises concerns about the users' trust towards riding in a fully autonomous vehicle [4], [5]. To separate the question of trust from financial considerations involved in purchasing an autonomous vehicle, the authors examine the issues of trust in the context of autonomous taxis. Specifically, the authors examine the users' initial trust in autonomous vehicles that are built before any interaction or experience with an autonomous vehicle occurs. An autonomous car is defined by some researchers as a self-driving vehicle that can perceive the surrounding environment and navigate itself without human intervention [8]. The authors adopt a definition of an autonomous vehicle corresponding to level 5 autonomy level, whereby "an automated driving system (ADS) on the vehicle can do all the driving in all circumstances [and] the human occupants are only passengers and need never be involved in driving" [14]. The authors define an autonomous taxi as an autonomous vehicle used for the commercial purpose of driving passengers to destinations. Although safety concerns towards autonomous vehicles among some populations worldwide are declining, people still have doubts. The analysis shows that 47% of the U.S. population thinks self-driving cars will not be safe [4], [5]. Only 28% of drivers worldwide think autonomous taxis will eventually replace human-driven taxis [9]. Also, the recent accident records of autonomous vehicles have increased distrust in autonomous taxis [4], [5], [13]. Some recent publications discuss experiences and technological solutions for autonomous vehicles [6], [7], [10]. However, these publications have not considered the process of building users' initial trust towards autonomous vehicles and the influence of this trust towards riding in a fully autonomous vehicle. The authors attempt to close the gap and answer the question: What factors influence the users' trusting intention when deciding to ride in an autonomous vehicle? The authors adopt the initial trust model established in [8] as a combination of the theory of reasoned action (TRA) with the trust models to investigate the research question. The initial trust model examines the influence of trust base factors and subjective norms on trusting beliefs, trusting attitude, and trusting intention. It assesses eight trust base factors belonging to cognitive, personality, calculative, and institutional categories. The institutional base includes organizational and technological factors. The authors note that an autonomous taxi differs from an autonomous vehicle as such because autonomous taxis represent technological artifacts occupying a specific social position. Then, the initial trust model that considers organizational and institutional factors is particularly relevant. Trusting in autonomous taxis involves trusting in both technology and the service-providing company; therefore, the initial trust model provides a suitable framework to examine users' initial trust built towards autonomous taxis [8].

The paper is organized as follows. The next section explains the theoretical framework and hypotheses development. The third section concentrates on the research approach and describes data collection. The fourth section focuses on data analysis and results. The final section presents findings, describes contribution, implications, and limitations, and concludes with a discussion on future research directions.

2. Theoretical Foundation and Hypotheses Development

Trust is defined as the willingness of a party to be vulnerable to the actions of another party based on the expectation that the other party will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party. Trust can manifest in different ways based on the trustor-trustee relationship, for instance in the form of identity-based, deterrent-based, calculative-based, and institutional-based trust [12]. Autonomous taxi services are a new phenomenon in the U.S. Since most people in the U.S. have not experienced riding in an autonomous vehicle, this paper focuses on building trust before the trustor's experience or interaction with the trustee. This concept, termed initial trust, can be described as placing trust in an unfamiliar entity and dealing with a relationship that lacks an emotional connection and knowledge about the trustee [12]. In [8], the

authors modified the initial trust model and applied it in the context of a national identity system. The authors further revised the initial trust model to accommodate the context of autonomous vehicles and developed a version as shown in Fig. 1 (A). An autonomous vehicle can be considered as an intelligent machine, a smart system, or intelligent automation technology [10], [15], [16]. The authors suggest that people tend to view and interact with intelligent machines like they were humans and attach identical social rules to technology as they would do to people. In [8], the authors applied this concept to constructs like faith in humanity and proposed that faith in humanity can be expanded to pertain to perceptions of nonhuman objects including information systems. In [10], the authors believed the efficient "trusted" collaboration between human and artificial intelligence systems is vital to the business logistics systems. Various factors affect trust in a robotic system that can differentiate between constructs applied to humans, organizations, and technology. The authors consider autonomous vehicles as a subset of robots and robots as intelligent machines. Trusting beliefs are defined as the trustor's perception of whether the trustee has the desired attributes to be trusted, and include three dimensions: reliability, competence, and integrity.

Five trusting bases are assumed to influence trusting beliefs. They are the personality base, cognitive base, calculative base, institutional base, and knowledge base [8]. The authors do not include the knowledge trusting base in this context because the technology at hand is not widely available to the general public. Furthermore, the definition of initial trust implies that the trustor knows little to nothing about the trustee [8]. The personality trusting base is an individual's propensity to trust as well as his disposition to trust [12]. There are two subcomponents of this base. They are faith in humanity and a trusting stance. Faith in humanity refers to an individual's belief about human nature. It consists of reliability, competence, and integrity, similar to trusting beliefs [12]. A person with a strong faith in humanity is generally prone to trusting others. This trusting base is noticeable in unfamiliar circumstances when little situation information is known, because in these cases, people's simple beliefs in human nature are more prominent in building their initial trusting beliefs [8]. Previous investigations found that faith in humanity positively affects trusting beliefs towards technology. In [12], the authors found that disposition to trust (which is composed of faith in humanity and trusting stance) positively influences user trust in Uber drivers and user trust in the Uber app. Therefore, the authors suppose that faith in humanity is a key factor that influences trusting beliefs in the context of autonomous taxis. Therefore, H1: *Faith in humanity is positively correlated with trusting beliefs about autonomous taxis.*

The authors define faith in intelligent machines as an individual's beliefs about the nature of intelligent machines and robots. They distinguish between having faith in humans and having faith in robots to test if people distinguish between the two concepts when building initial trust. Several intelligent machines have outperformed humans in various endeavors. For instance, the supercomputer Watson beat some of the strongest contestants in jeopardy [10]. Knowledge of these achievements may influence a person's faith in such machines. The authors propose that when faced with an unknown intelligent machine, people with a strong faith in intelligent machines will generally tend to build positive trusting beliefs towards the machine more so than others with low faith in intelligent machines. Therefore, H2: *Faith in intelligent machines and robots is positively correlated with trusting beliefs about autonomous taxis.*

Trusting stance towards humanity refers to an individual's (trustor's) belief that dealing with another person (trustee) will turn out favorably, as if the trustee has good intentions and is reliable, notwithstanding the trustee's actual characteristics. Someone with a high trusting stance will generally tend to trust others while expecting reciprocity. The revelation of more information about the trustee may lead to the alteration in the trustor's trusting strategy. Previous publications found a significant relationship between trusting stance and trusting beliefs towards technology [8]. The authors suggest that potential users of autonomous taxis would expect that the humans involved in manufacturing and deploying the vehicles have good intentions and are reliable. Before becoming aware of detrimental information about these people, the trustor's trusting stance towards humanity should play a positive role in building a person's trusting beliefs towards riding in autonomous taxis. Therefore, H3: *Trusting stance towards humanity is positively correlated with trusting beliefs about autonomous taxis.*

Similar to the trusting stance towards humanity, the authors define trusting stance towards intelligent machines and robots as an individual's (trustor's) belief that dealing with an intelligent machine or robot (trustee) will turn out favorably as if the trustee has good intentions and is reliable, despite the trustee's actual characteristics. People may have the disposition to trust an intelligent system until something happens to deter them from that initial stance since

interacting or using the machine will have more significant beneficial results than being cautious [8]. In [12], the authors suggest that a person with a high trusting stance would be more willing to rely on technology. The authors propose that people with a positive trusting stance for intelligent machines and robots are prone to developing positive trusting beliefs towards specific intelligent machines and robots before interacting with them. Therefore, H4: *Trusting stance towards intelligent machines and robots is positively correlated with trusting beliefs about autonomous taxis.*

Social psychologists view trust as a cognitive process and propose that different cognitive cues and impressions will influence building trust. Cognitive familiarity with a trustee is a component of trust situated between the spectrum of total knowledge and total ignorance. Trustors use cognitive familiarity when they lack information about the trustee and recurring experiences with the trustee [8]. The authors have looked at components of the cognitive trusting base, including stereotyping, unit grouping, and reputation. Previous publications found that company or vendor reputation affects trusting beliefs towards technology [8]. A good reputation lends credence to the trustworthiness of the trustee [12]. Without any direct experiential information, the reputation of the trustee may alter the trustor's trusting beliefs. The authors consider the reputation of autonomous vehicles. Various news articles reported on autonomous vehicles undergoing test runs being involved in accidents [4], [5]. People exposed to such news may see autonomous vehicles as having a negative reputation and build negative trusting beliefs towards them. Therefore, H5: *Reputation of autonomous vehicles is positively correlated with trusting beliefs about autonomous taxis.*

In deciding whether to trust others, a trustor tends to assume that people act rationally, calculative, and in their self-interest. Moreover, the trustor assumes that the trustees will refrain from opportunistic behavior unless it is advantageous. A trustor trusts the trustee he is dealing with when he thinks the cost of the trustee being untrustworthy outweighs the benefit [8]. Previous findings indicate a positive relationship between the cost/benefit calculation and trust in technology [8]. The authors apply the cost/benefit calculation concept to autonomous vehicles and suggest that when building trusting beliefs, potential users consider the pros and cons of riding in autonomous taxis. Therefore, H6: *Calculative cost/benefit for autonomous vehicles is positively correlated with trusting beliefs about autonomous taxis.*

Artificial intelligence has brought the above benefits to society in many industries including education, healthcare, and agriculture [1]. In the automotive industry, projects like "Drive Me" in Sweden aim to examine the societal benefits of autonomous driving [13]. In [3], the researchers suggest that some benefits of the growth of automated driving systems include increased productivity of users, increased environmentally friendly vehicles, and reduced traffic congestion. If a person believes that the people around them benefit from unfamiliar technology, this may influence his trusting beliefs towards that technology. The authors include the construct to initial trust in technology investigations called perceived societal benefits to measure the user perception of value delivered by the emerging technology to the user's community and society. Therefore, H7: *Perceived societal benefits are positively correlated with trusting beliefs about autonomous taxis.*

Given the establishment of necessary institutional structures and an orderly social environment, individuals are generally more likely to trust [12]. In [8], the researchers say that users consider the technology structures and organizational structures when building initial trust in an organization's environment. Previous publications identify two subcomponents of the institutional trusting base that affect trust-building including situation normality and structural assurance [12]. Situation normality refers to the state of things being normal and in order. An individual may resort to relying on how familiar the situation feels when building initial trust towards something he encounters for the first time [12]. Previous publications found a positive relationship between situation normality and trusting beliefs towards technology [8]. The authors presume that users will most likely have positive, initial trusting beliefs towards an autonomous vehicle if they believe that most autonomous vehicles will be manufactured and deployed with integrity in a considerate and competent manner. In addition, the authors consider that potential users are more likely to have positive, initial trusting beliefs in an autonomous taxi if they believe that most taxi service companies are operated with integrity in a considerate and competent manner. Therefore, H8: *Technology situation normality is positively correlated with trusting beliefs about autonomous taxis.* H9: *Organizational situation normality is positively correlated with trusting beliefs about autonomous taxis*.

Structural assurance refers to the implementation of safeguards, for instance, contracts and regulations [10], [14], [16]. A company's legal safeguards will strengthen an individual's belief that the company would try to adhere to its policies and avoid legal repercussions. Similar to situation normality, structural assurance is applied in technology and an organizational context. The authors suggest that from a technology standpoint, users would want to build more concrete trusting beliefs towards autonomous vehicles with technological safeguards including radar, cameras, sensors, and an emergency stop button. In an organizational context, the authors believe that when considering riding in an autonomous taxi, a potential user may rely on his familiarity with the organizational policies, norms, and regulations of the taxi service provider to determine the reliability of their autonomous taxis. Therefore, H10: *Technology structural assurance is positively correlated with trusting beliefs about autonomous taxis*. H11: *Organizational structural assurance is positively correlated with trusting beliefs about autonomous taxis.*

Having identified the trusting bases, which precede trusting belief, the authors propose that a person's trusting beliefs are related to his trusting intention through his trusting attitude. The dynamics of trust can be inferred theoretically, but in practice, the impact of distrust will be expressed through the trustor's behavior and opinions [12]. Trusting intention is the willingness of the trustor to rely on the trustee; trusting attitude is the positive or negative evaluation by the trustor of behaviors related to trust [8]. In the context of autonomous vehicles, trust-related behaviors include bringing a dependent along for the ride and planning to read or watch videos while in the vehicle. The authors suggest that the user's evaluation of these behaviors determines his intention to rely on the autonomous vehicle. Therefore, H12: *Trusting beliefs about autonomous vehicles are positively correlated with a trusting attitude towards autonomous taxis.* H13: *Trusting attitude towards autonomous vehicles is positively correlated with trusting intention towards autonomous taxis.*

Subjective norm is the view someone holds that the persons whose opinions are valued think they should do a specific action. In [8], the researchers found that social influence had a more decisive influence on trusting beliefs than any of the trusting bases in the context of building initial trust towards technology. The authors believe that someone may come to be influenced by an important person in his life to trust autonomous vehicles through compliance or internalization. When influenced through compliance, subjective norm and intention are directly related [9], since an individual will be sufficiently influenced to comply with the referent's recommendation. When influenced through internalization, someone first adopts the critical person's system as his own before building an intention. Therefore, the influence of subjective norms on intention is indirect. Previous studies have verified these compliance and internalization relationships [8]. The authors consider that the beliefs, attitudes, and recommendations of essential influencers can either directly or indirectly influence their trusting intention towards riding in autonomous vehicles. Therefore: H14a: *Subjective norm is positively correlated with trusting intention towards autonomous taxis.* H14b: *Subjective norm is positively correlated with a trusting attitude towards autonomous taxis.* H14c: *Subjective norm is positively correlated with trusting beliefs about autonomous taxis*.

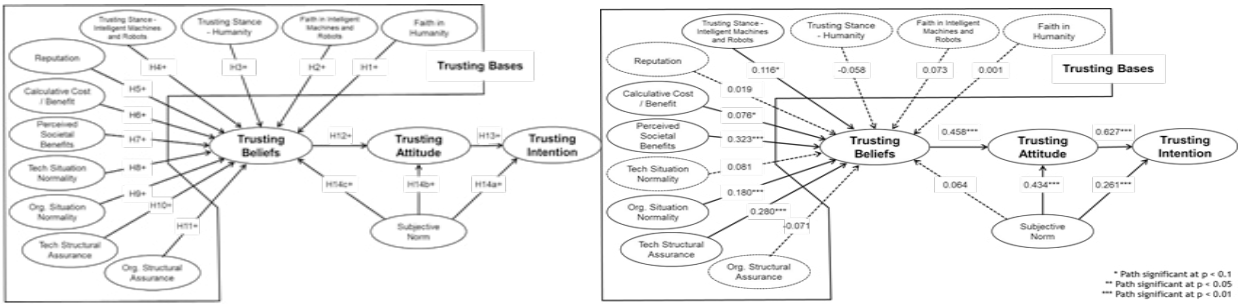

Fig. 1. A - Initial trust in an autonomous vehicle model (left-hand side); B - PLS structural equation path results (right-hand side)

3. Methodology and Data Collection

The authors conducted a survey-based study to assess the initial trust model in the context of building trust in autonomous taxis. They selected the context of autonomous taxis because the provision of an autonomous taxi

service is a soon-to-be-reality. Also, there are severe risks and concerns involved in using this technology. Companies and investors willing to associate themselves with this service would want to know the user's perception towards such a service and exactly what influences his perception. The authors adapted existing scales or constructed new scales based on previous publications. Each item was measured using a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The authors adapted scales for trusting intention, trusting beliefs, faith in humanity and intelligent machines, situation normality, structural assurance, and trusting stance of trust measures from [12]. The authors operationalized trusting beliefs and trusting intention to refer specifically to autonomous taxis. They operationalized the personality and institutional bases to target more general entities, specifically, humans and intelligent machines for the personality bases and taxi service companies and autonomous vehicles for the institutional bases. The authors measured trusting beliefs using approximately three items for each dimension of beliefs (reliability, competence, integrity) as suggested in [12]. They measured trusting intention using items that evaluate one's desire to depend on an autonomous taxi and one's willingness to exhibit trusting behaviors such as supporting, providing personal information to, and using autonomous taxis. The authors applied multiple trust-related behaviors when measuring trusting intention [12]. The authors adopted the scale used to measure subjective norm and trusting attitude as advised in [8]. The trusting attitude items examined whether the three trusting behaviors would have desirable outcomes. The subjective norm items looked at if persons significant to the respondent wish that the respondent would use autonomous taxis concerning the trusting behaviors. The authors retrieved the scale for the cost/ benefit calculation from [3]. This scale examined one's view on whether autonomous taxis and taxi service companies have anything to gain by not being reliable. The authors derived the scale for reputation as instructed in [12]. The scale relating to reputation addresses the competence and reliability attributes of autonomous vehicles and taxi service companies. The scale developed for perceived societal benefits coincides with published investigations on autonomous vehicles as suggested in [3]. Undergraduate students from a public university in the U.S. participated in the study. Initially, 281 responses were collected by using the online survey. The 208 (74%) responses were determined to be valid. The 73 responses were removed based on the following rules: (a) the respondent did not finish the survey, (b) the respondent had never used a taxi service or Uber, (c) the respondent finished the survey within 4 minutes, and (d) the respondent provided conflicting answers. Gender, academic level, and ethnicity information were collected as demographic data. To reduce the potential for common method bias, the authors arranged survey questions. According to the t-test results, there was no significant difference between the early and late responses; therefore, there was no evidence of non-response bias found.

4. Analysis of Results

The authors applied PLS-structural equation modelling (PLS-SEM) for data analysis. PLS-SEM was used to extend an existing structural theory due to its strong statistical power with a complex model structure and the small sample size. The sample size was evaluated against the model's background and data characteristics using SmartPLS 3 as the major statistical software. The PLS algorithm was applied to calculate the measurement model and the structural equation model. For the bootstrapping process, 5,000 samples were used to estimate the standard bootstrap error. The 5-point Likert scale has been applied. The mean responses and the standard deviations are shown in Table 1. Two constructs show means less than 3, revealing a negative opinion. These means suggest that respondents were cautious about the intention to trust the autonomous taxis. To evaluate the reliability and validity of the measurement model, the factor loadings, Cronbach's alpha, composite reliability, and average variance extracted (AVE) were calculated and analysed. The overall result demonstrates that the model has high reliability. The summary of the construct correlation, reliability, and validity are shown in Table 2. On the one hand, the Cronbach's alpha and composite reliability values of all constructs are higher than the recommended lower bound of 0.7 [3]. On the other hand, all constructs' AVE values are higher than the threshold value of 0.5. Besides, the square root of the AVE of each construct is higher than its inter-factor correlations with other constructs. Therefore, the authors assume that all constructs in the model show sufficient reliability. The authors used the r-square and significant structural paths to evaluate the PLS-SEM model. Overall, the r-square for trusting beliefs is 73.9%, for trusting attitude is 64.9%, and for trusting intention is 69.7%. The model with path results is shown in Fig. 1 (B).

Among all constructs, five constructs are statistically significant and directly positively influence trusting beliefs: faith in intelligent machines and robots, calculative cost/benefit, perceived societal benefits, organizational situation normality, and tech structural assurance. This result supports Hypotheses 4, 6, 7, 9, and 10. Besides, the PLS model shows that trusting beliefs have a statistically significant positive influence on trusting attitudes, which supports Hypothesis 9. Meanwhile, a trusting attitude has a statistically significant positive influence on trusting intention, which supports Hypothesis 10. Situation normality shows a positive statistically significant influence on trusting attitude and trusting intention, but the influence on trusting beliefs is not significant. This result supports Hypotheses 11b and 11c. The outcomes of the hypothesis tests are summarized in Table 2.

Table 1. Measurement scales and descriptive statistics for model constructs

Construct	Means	SD
Faith in Humanity	3.87	0.69
Trust in Intelligent Machines and Robots	3.40	1.04
Trusting Stance towards Humanity	3.85	0.90
Trusting Stance towards Intelligent Machines and Robots	3.12	1.12
Reputation	3.24	0.98
Calculative Cost/Benefit	3.69	1.01
Perceived Societal Benefits	3.32	1.08
Technology Situation Normality	3.63	0.93
Organizational Situation Normality	3.61	0.79
Technology Structural Assurance	3.25	1.09
Organizational Structural Assurance	3.55	0.84
Subjective Norm	3.18	0.96
Trusting Beliefs	3.34	1.00
Trusting attitude	3.12	1.01
Trusting Intention	2.98	1.08

Table 2. Summary of Hypotheses Tests.

Hypotheses			Decision
H1	Faith in Humanity → Trusting Beliefs	0.001	Not Supported
H2	Faith in Intelligent Machines and Robots → Trusting Beliefs	0.073	Not Supported
H3	Trusting Stance towards Humanity → Trusting Beliefs	-0.058	Not Supported
H4	Trusting Stance towards Intelligent Machines and Robots → Trusting Beliefs	0.116*	Supported
H5	Reputation → Trusting Beliefs	0.019	Not Supported
H6	Calculative Cost/Benefit → Trusting Beliefs	0.076*	Supported
H7	Perceived Societal Benefits → Trusting Beliefs	0.323***	Supported
H8	Technology Situation Normality → Trusting Beliefs	0.081	Not Supported
H9	Organizational Situation Normality →Trusting Beliefs	0.180***	Supported
H10	Technology Structural Assurance → Trusting Beliefs	0.280***	Supported
H11	Organizational Structural Assurance → Trusting Beliefs	-0.071	Not Supported
H12	Trusting Beliefs → Trusting Attitude	0.458***	Supported
H13	Trusting Attitude → Trusting Intention	0.627***	Supported
H14a	Subjective Norm → Trusting Intention	0.261***	Supported
H14b	Subjective Norm → Trusting Attitude	0.434***	Supported
H14c	Subjective Norm → Trusting Beliefs	0.064	Not Supported
* p < 0.1; ** p < 0.05; *** p < 0.01.			

5. Conclusion

The findings suggest that faith in intelligent machines and robots, calculative cost/benefit perception, perceived societal benefits, organizational situation normality, and technology structural assurance have substantial positive impacts on trusting beliefs in the context of autonomous taxis. Therefore, autonomous car manufacturing companies and taxi service companies should emphasize faith in intelligent machines and robots, calculative cost/benefit perception, perceived societal benefits, organizational situation normality, and technology structural assurance in building initial trust in an autonomous taxi. The result indicates that subjective norm has a more substantial impact on trusting attitude than trusting intention and no significant impact on trusting beliefs. Trusting beliefs have a substantial direct effect on trusting attitude, and a trusting attitude has a substantial impact on trusting intention analogous to past investigations. The findings have an influence on the theory and practice as the early perceptions of technology affect the later perceptions of that technology. Future research direction is to determine the relevance of the findings. While student participants are potential users of autonomous taxis, they do not represent all prospective users. Future investigations can be applied to diverse populations to determine the differences in their perspectives towards trusting autonomous vehicles. Finally, future investigations may include perceived risk and perceived privacy concerns as additional factors for initial trust-building in autonomous vehicles.

References

[1] Bergsten, S., & Rivas, P. (2019). Societal benefits and risks of artificial intelligence: A succinct survey. Proceedings of the International Conference on Artificial Intelligence (ICAI).

[2] Chan, C.-Y. (2017). Advancements, prospects, and impacts of automated driving systems. International journal of transportation science and technology, 6(3), 208-216.

[3] Gefen, D. (2003). Assessing unidimensionality through LISREL: An explanation and an example. Communications of the Association for Information Systems, 12(1), 2.

[4] Giffi, C., Vitale Jr, J., Schiller, T., & Robinson, R. (2018). A reality check on advanced vehicle technologies. Insights exploring new automotive business models and consumer preferences. Deloitte Insights, Future of Mobility, 8-16.

[5] Hancock, P. A., Billings, D. R., Schaefer, K. E., Chen, J. Y., De Visser, E. J., & Parasuraman, R. (2011). A meta-analysis of factors affecting trust in human-robot interaction. Human factors, 53(5), 517-527.

[6] Janssen, C. P., Boyle, L. N., Kun, A. L., Ju, W., & Chuang, L. L. (2019). A hidden Markov framework to capture human-machine interaction in automated vehicles. International Journal of Human-Computer Interaction, 35(11), 947-955.

[7] Kim, S., Chang, J. J. E., Park, H. H., Song, S. U., Cha, C. B., Kim, J. W., & Kang, N. (2020). Autonomous taxi service design and user experience. International Journal of Human-Computer Interaction, 36(5), 429-448.

[8] Li, X., Hess, T. J., & Valacich, J. S. (2008). Why do we trust new technology? A study of initial trust formation with organizational information systems. The Journal of Strategic Information Systems, 17(1), 39-71.

[9] Little, A. D. (2019). Transport modes that will most likely be replaced by autonomous cars, according to drivers in selected countries worldwide as of 2018. Retrieved from https://www.statista.com/statistics/1010338/transport-modes -likely-to-be-replaced-by-autonomous-cars/

[10] Lokshina, I. V., & Lanting, C. J M. (2020). An attempt to model decision processes for time-constrained applications. Proceedings of the Science Fiction Prototyping Conference 2020, 27-32.

[11] Marshall, A. (2018). Why Uber's self-driving crash is confusing to humans. Wired Magazine, www. wired. com. Retrieved from https://www.wired.com/story/uber-self-driving-crash-explanation-lidar-sensors/.

[12] McKnight, D. H., Choudhury, V., & Kacmar, C. (2002). Developing and validating trust measures for e-commerce: An integrative typology. Information systems research, 13(3), 334-359.

[13] Miörner, J., & Trippl, M. (2019). Embracing the future: path transformation and system reconfiguration for self-driving cars in West Sweden. European Planning Studies, 27(11), 2144-2162.

[14] NHTSA. (2020). Automated Vehicles for Safety. Retrieved from https://www.nhtsa.gov/technology-innovation/automated-vehicles.

[15] Poniszewska-Maranda, A., Kaczmarek, A., Kryvinska, & N., Xhafa, F. (2019) Studying usability of AI in the IoT systems/paradigm through embedding NN techniques into mobile smart service system. Computing, 101(11), 1661–1685. https://doi.org/10.1007/s00607-018-0680-z.

[16] TechWorld. (2018). Which companies are making driverless cars? Retrieved from https://www.techworld.com/picture-gallery/data/-companies-working-on-driverless-cars-3641537/.