AI in Autonomous Vehicles

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Abstract*: The integration of Artificial Intelligence (AI) in autonomous vehicles represents a transformative leap towards safer, more efficient, and technologically advanced transportation systems. This abstract provides a comprehensive overview of the dynamic landscape where AI converges with autonomous vehicles, examining the synergies, challenges, and far-reaching implications of this groundbreaking integration*

AI-Powered Perception and Decision-Making: Delving into the technological core, the abstract explores how AI empowers autonomous vehicles with sophisticated perception systems, such as computer vision and sensor fusion. It discusses the role of machine learning algorithms in real-time decision-making, enabling vehicles to adapt to dynamic road conditions and unforeseen circumstances.

Challenges in Autonomy: Recognizing the complexity of autonomous systems, the abstract addresses challenges such as handling edge cases, ensuring robustness against adversarial attacks, and navigating regulatory and ethical considerations. It emphasizes the importance of addressing these challenges to foster public trust and acceptance of autonomous vehicles.

Human-AI Interaction in Autonomous Vehicles: Examining the interface between humans and AI-driven vehicles, the abstract discusses the importance of designing intuitive and trustworthy communication channels. It explores advancements in natural language processing and gesture recognition, fostering seamless collaboration between humans and autonomous systems.

Regulatory Landscape and Ethical Considerations: Recognizing the pivotal role of regulations, the abstract discusses the evolving regulatory landscape for autonomous vehicles. It delves into ethical considerations surrounding AI decisions in critical situations, underscoring the need for a harmonized approach to ensure responsible AI deployment in autonomous driving scenarios.

Keywords: Digital Banking, Information Technology, Internet Banking, India, Core Banking Solution, Online Payments, UPI

REFERENCES

[1]. Anderson, J. D., & Anderson, S. L. (2019). Autonomous Vehicles: A Comparative Study of California State Regulations and NHTSA's Federal Automated Vehicles Policy. *Transportation Research Record: Journal of the Transportation Research Board, 2673*(12), 214–223. DOI: 10.1177/0361198119847424

[2]. Althoff, M., de la Puente, E., &Wollherr, D. (2016). Predictive Modeling of Pedestrian Behavior in Urban Areas. In *2016 IEEE Intelligent Vehicles Symposium (IV)* (pp. 1002–1007). DOI: 10.1109/IVS.2016.7535575

[3]. Chen, X., Ma, H., Liu, Y., & Chen, Y. (2015). A Survey of Sensing and Control for Autonomous Vehicles. *IEEE Transactions on Intelligent Transportation Systems, 16*(5), 2349–2369. DOI: 10.1109/TITS.2015.2399223

[4]. Endsley, M. R., Kiris, E. O., & McCarley, J. S. (2017). Situation awareness-oriented design: From user requirements to system specifications. *Ergonomics, 60*(4), 467–487. DOI: 10.1080/00140139.2016.1185309

[5]. KIT (Karlsruhe Institute of Technology). (2021). Autonomous Vehicle Test Report 2021. https://www.kit.edu/kit/english/pi_2021_139_kit-releases-first-comprehensive-report-on-autonomous-driving-in-germany.php

[6]. Lee, S., Cheng, A., & Chen, J. (2018). An Assessment of Public Attitudes and Awareness toward Autonomous Vehicles in the United States. *Transportation Research Part F: Traffic Psychology and Behaviour, 58*, 1022–1031. DOI: 10.1016/j.trf.2018.06.024

[7]. Rajkumar, R., Sivakumar, D., & Geyer, C. (2012). Autonomous Driving in Urban Environments: Boss and the Urban Challenge. *Journal of Field Robotics, 29*(6), 904–939. DOI: 10.1002/rob.21450

[8]. Shalev-Shwartz, S., Shammah, S., &Shashua, A. (2016). Safe, Multi-Agent, Reinforcement Learning for Autonomous Driving. In *Proceedings of the 29th International Conference on Neural Information Processing Systems - Volume 1* (pp. 971–979). https://dl.acm.org/doi/10.5555/3157382.3157510