

Chapter 6

AI–Driven Predictive Analytics for Enhancing Automotive Safety in Financial Risk Assessments in Cloud Data

G. V. Radhakrishnan

 <https://orcid.org/0009-0003-2710-4678>

KIIT University, India

Sarvagya Jha

 <https://orcid.org/0009-0004-5078-8227>


Rutgers University, USA

R. Varalakshmi

 <https://orcid.org/0000-0002-1171-9825>

*Shrimathi Devkunvar Nanalal Bhatt
Vaishnav College for Women, India*

S. Sruthi

 <https://orcid.org/0000-0002-0644-1566>

*VET Institute of Arts and Science (Co-
Education) College, Thindal, India*

Namrata Kapoor Kohli

 <https://orcid.org/0009-0001-4482-9764>

*Symbiosis University of Applied
Science, Indore, India*

Suraj Prakash Singh

*School of Management Sciences
Varanasi, India*

ABSTRACT

Prediction technologies based on AI drive crucial automotive safety and financial risk assessment which results in minimizing losses as well as increasing road safety. A Hybrid AI-Econometrics Model which merges machine learning algorithms with econometric systems serves as the main proposal to estimate and quantify economic consequences linked to automotive accidents. TensorFlow performs deep learning

DOI: 10.4018/979-8-3693-9581-3.ch006

operations within the framework alongside Statsmodels to analyze telematics data, insurance claims data and macroeconomic data for determining risks of accidents and their connected financial costs. The model uses deep learning algorithms to find patterns in accidents before calculating financial risk through GARCH (Generalized Autoregressive Conditional Heteroskedasticity) and Vector Autoregression. The model provides both accurate predictions and understandable results which make it acceptable for various users including insurers and governmental agencies and automotive industries. The research shows better assessment capabilities as the model enhances protective driving environments

I. INTRODUCTION

The integration of artificial intelligence (AI) with econometric models is being explored as a transformative solution for automotive safety and financial risk assessment. The research uses a Hybrid AI-Econometrics Model, which combines deep learning with econometric techniques to enhance risk assessment in the automotive sector. This approach improves predictive accuracy (Khadka, M. et al., 2025) and interpretability by analysing real-time data from telematics, IoT sensors, insurance databases, and economic indicators. The hybrid methodology strengthens proactive accident prevention mechanisms and is more robust and scalable than conventional models as developed by (Boinapalli, N. R. et al., 2023). The proposed model combines deep learning with econometric techniques to improve predictive accuracy and interpretability in automotive safety. Tensor Flow and Stats models are used for pattern recognition and forecasting (Pandey, B. K., & Pandey, D., 2025), analysing accident trends and financial liabilities. This AI-driven approach enhances risk mitigation by analyzing real-time data from telematics, IoT sensors, insurance databases, and economic indicators. The study aims to bridge the gap between AI and financial risk evaluation in the automotive sector as supported by (Jahin, M. A. et al., 2025).

16 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage: www.igi-global.com/chapter/ai-driven-predictive-analytics-for-enhancing-automotive-safety-in-financial-risk-assessments-in-cloud-data/374706

Related Content

Hybrid Data Security Model for Cloud

Sandeep K. Sood (2013). *International Journal of Cloud Applications and Computing* (pp. 50-59).

www.irma-international.org/article/hybrid-data-security-model-for-cloud/95043

Seizing Electronic Evidence from Cloud Computing Environments

Josiah Dykstra (2015). *Cloud Technology: Concepts, Methodologies, Tools, and Applications* (pp. 2033-2062).

www.irma-international.org/chapter/seizing-electronic-evidence-from-cloud-computing-environments/119946

Traffic Analyses and Measurements: Technological Dependability

Rossitza Goleva, Dimitar Atamian, Seferin Mirtchev, Desislava Dimitrova, Lubina Grigorova, Rosen Rangelov and Aneliya Ivanova (2015). *Resource Management of Mobile Cloud Computing Networks and Environments* (pp. 122-173).

www.irma-international.org/chapter/traffic-analyses-and-measurements/125964

Designing Health Systems for Better, Faster, and Less Expensive Treatment

Rita Komalasari (2023). *Exploring the Convergence of Computer and Medical Science Through Cloud Healthcare* (pp. 1-13).

www.irma-international.org/chapter/designing-health-systems-for-better-faster-and-less-expensive-treatment/313554

The Evolution of Cloud Computing Architectures: A Comparative Analysis of Traditional Virtualization and Containerization Technologies

Hedia Zardi, Walid Karamti, Thuraya Alwehaid, Shahad Almisedand Wajd Alsalloum (2025). *International Journal of Cloud Applications and Computing* (pp. 1-15).

www.irma-international.org/article/the-evolution-of-cloud-computing-architectures/391348