Patent Search

Invention Title	MACHINE LEARNING-DRIVEN STOCHASTIC DIFFERENTIAL EQUATION INVENTORY MODEL FOR DYNAMIC STOCK OPTIMIZATION
Publication Number	32/2023
Publication Date	11/08/2023
Publication Type	INA
Application Number	202311049646
Application Filing Date	24/07/2023
Priority Number	
Priority Country	
Priority Date	
Field Of Invention	COMPUTER SCIENCE
Classification (IPC)	A63B 210000, G06F 171300, G06N 070800, G06Q 100800, H02H 031600

Inventor

Name	Address	Country
Dr. Vipin Kumar	Associate Professor, Department of Mathematics, B K Birla Institute of Engineering and Technology, Pilani, Rajasthan, India, Pincode: 333031	India
Dr. Anupama Sharma	Associate Professor, Department of Mathematics, B K Birla Institute of Engineering and Technology, Pilani, Rajasthan, India, Pincode: 333031	India
Dr. Jyoti Singh Raghav	Associate Professor, Department of Mathematics, Rama University, Kanpur, Uttar Pradesh, India, Pincode: 209217	India
Dr. Sanjay Kumar Sharma	Associate Professor (Mathematics), Applied Science and Humanities, Sobhasaria Group of Institutions, NH-52, Gokulpura, Sikar, Rajasthan, India, Pincode: 332001	India
Dr. Kalpana	Assistant Professor, Department of Mathematics, LR College, Sahibabad, Ghaziabad, Uttar Pradesh, India, Pincode: 201007	India
Dr. Amit Kumar	Assistant Professor, Department of Mathematics, S.M.P Govt. Girls PG College, Meerut, Uttar Pradesh, India, Pincode: 250002	India
Dr. K. Nandagopal	Associate Professor, Freshman Department, Mohan Babu University, Tirupati, Andhra Pradesh, India, Pincode:517102	India
Dr. Animesh Kumar Sharma	Assistant Professor, Department of Mathematics, Faculty of Science and Technology, The ICFAI University, Raipur, Chhattisgarh, India, Pincode: 492001	India
Mrs. Akkaraju Lalitha	Adjunct Faculty, Faculty of Management and Commerce, PES University, Bengaluru, Karnataka, India, Pincode: 560085	India
Dr. C. Gayathri	Assistant Professor in Mathematics, Department of Science and Humanities, The Oxford College of Engineering, 10th milestone, Bommanahalli, Hosur Road, Bengaluru, Karnataka, India, Pincode: 560068	India
Mr. P. Shiva Kumar	Assistant Professor, Department of Electrical and Electronics Engineering, Institute of Aeronautical Engineering, Hyderabad, Telangana, India, Pincode: 500043	India

Applicant

Name	Address	Country
Dr. Vipin Kumar	Associate Professor, Department of Mathematics, B K Birla Institute of Engineering and Technology, Pilani, Rajasthan, India, Pincode: 333031	India
Dr. Anupama Sharma	Associate Professor, Department of Mathematics, B K Birla Institute of Engineering and Technology, Pilani, Rajasthan, India, Pincode: 333031	India
Dr. Jyoti Singh Raghav	Associate Professor, Department of Mathematics, Rama University, Kanpur, Uttar Pradesh, India, Pincode: 209217	India
Dr. Sanjay Kumar Sharma	Associate Professor (Mathematics), Applied Science and Humanities, Sobhasaria Group of Institutions, NH-52, Gokulpura, Sikar, Rajasthan, India, Pincode: 332001	India
Dr. Kalpana	Assistant Professor, Department of Mathematics, LR College, Sahibabad, Ghaziabad, Uttar Pradesh, India, Pincode: 201007	India
Dr. Amit Kumar	Assistant Professor, Department of Mathematics, S.M.P Govt. Girls PG College, Meerut, Uttar Pradesh, India, Pincode: 250002	India
Dr. K. Nandagopal	Associate Professor, Freshman Department, Mohan Babu University, Tirupati, Andhra Pradesh, India, Pincode:517102	India
Dr. Animesh Kumar Sharma	Assistant Professor, Department of Mathematics, Faculty of Science and Technology, The ICFAI University, Raipur, Chhattisgarh, India, Pincode: 492001	India
Mrs. Akkaraju Lalitha	Adjunct Faculty, Faculty of Management and Commerce, PES University, Bengaluru, Karnataka, India, Pincode: 560085	India
Dr. C. Gayathri	Assistant Professor in Mathematics, Department of Science and Humanities, The Oxford College of Engineering, 10th milestone, Bommanahalli, Hosur Road, Bengaluru, Karnataka, India, Pincode: 560068	India
Mr. P. Shiva Kumar	Assistant Professor, Department of Electrical and Electronics Engineering, Institute of Aeronautical Engineering, Hyderabad, Telangana, India, Pincode: 500043	India

Abstract:

The invention relates to a machine learning-driven stochastic differential equation model for dynamic stock optimization in inventory management. The system integ machine learning algorithms, which learn and predict from historical data, and stochastic differential equations, which account for randomness and uncertainty in th and supply processes. The model generates probabilistic forecasts of future stock levels and optimizes them dynamically, adapting to new data and changing market This innovative approach provides an effective solution to the challenges of inventory management, enhancing operational efficiency, customer satisfaction, and stra decision-making across various industries.

Complete Specification

Description:The present invention relates to inventory management systems, more specifically, to a machine learning-driven stochastic differential equation model dynamic stock optimization. This innovative model uses machine learning algorithms and stochastic differential equations to predict stock levels and optimize inver an adaptive and dynamic manner. The method offers robustness in fluctuating market scenarios and is applicable across a broad range of industries, including but limited to manufacturing, retail, logistics, supply chain management, and e-commerce. This invention brings together the powerful predictive capabilities of machin learning with the mathematical precision of stochastic differential equations to provide a novel approach to dynamic inventory optimization.

Background of the invention:

Inventory management is a critical process in many industries such as manufacturing, retail, logistics, supply chain management, and e-commerce. The goal of inve management is to maintain an optimal level of stock to fulfill customer demand while minimizing costs associated with holding, ordering, and shortage of inventory Despite the key role it plays in ensuring operational efficiency and customer satisfaction, inventory management remains a challenging task due to various unpredi factors such as fluctuating demand, supply chain uncertainties, and market changes.

Traditional inventory management models, such as the Economic Order Quantity (EOQ) model and the Newsvendor model, provide analytical solutions for managir inventory. However, these models often rely on static, deterministic parameters, which limits their adaptability to real-world scenarios where demand and supply ar dynamic and uncertain. These traditional models may not perform effectively when the underlying assumptions do not hold, leading to suboptimal decision-making potential financial losses.

The advancements in technology, especially in the fields of machine learning and artificial intelligence, have provided promising avenues for improving inventory

View Application Status