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Web Based Platform for Startups and Investors to Connect and Predict Investment Returns Using Deep Learning

Prashant Dadasaheb Auti[1], Ganesh Hanumant Lekurwale[2], Aarti Ishwar Kshirsagar[3], Sakshi Subhash Pawar[4]
[1, 2, 3, 4]*Computer Department, Dy Patil Collage of Engineering, Pune*

Abstract: ***Investing in startups can be a high-risk, high-reward endeavor. Investors often face significant challenges in identifying promising startup opportunities and making informed investment decisions. Conversely, startups struggle to attract the attention of potential investors who align with their vision and goals. This paper presents a web-based platform that addresses these challenges by leveraging deep learning techniques to connect startups and investors and provide predictions on investment returns.***

The proposed platform serves as an online marketplace where startups can showcase their business plans, products, and financial projections. Simultaneously, investors can explore a diverse range of investment opportunities and gain access to detailed information about the startups. By integrating deep learning algorithms, the platform analyzes historical startup performance data, market trends, and other relevant factors to provide intelligent predictions on potential investment returns.

this paper proposes a web-based platform that leverages deep learning techniques to connect startups and investors and predict investment returns. By providing an online marketplace, personalized predictions, and an interactive environment, the platform offers a comprehensive solution to the challenges faced by both startups and investors. Through the fusion of advanced machine learning techniques and real-time data analysis, the platform empowers stakeholders to make informed investment decisions and foster the growth of the startup ecosystem.

Keywords: Component, Startups, Investors, Investment returns, Deep learning, Web-based platform, Predictive analytics

I. INTRODUCTION

Startups play a pivotal role in driving innovation, economic growth, and job creation. However, investing in startups comes with inherent risks and uncertainties. For investors, identifying promising startup opportunities and accurately predicting investment returns can be a challenging task. On the other hand, startups struggle to connect with investors who align with their vision and can provide the necessary funding and support. To address these challenges, this paper presents a web-based platform that leverages deep learning techniques to connect startups and investors and facilitate the prediction of investment returns.

The advent of deep learning, a subfield of machine learning, has revolutionized the way we analyze complex data and extract valuable insights. Deep learning algorithms excel at processing large amounts of data and uncovering intricate patterns and relationships. By harnessing the power of deep learning, the proposed platform aims to provide a data-driven and intelligent approach to startup-investor matchmaking and investment prediction.

The web-based platform serves as an online marketplace where startups can showcase their business plans, products, and financial projections. Simultaneously, investors can explore a diverse range of investment opportunities and access detailed information about the startups. The platform integrates sophisticated deep learning models trained on comprehensive datasets that encompass startup profiles, investment histories, industry-specific information, and economic indicators.

The core of the platform lies in the deployment of deep learning architectures, such as recurrent neural networks (RNNs) and convolutional neural networks (CNNs). These architectures enable the platform to capture complex temporal and spatial relationships within the data, thereby enhancing the accuracy and reliability of investment return predictions. Users can input specific parameters, such as industry sector, funding stage, and geographic location, to generate personalized predictions tailored to their investment preferences.

Transparency and reliability are crucial aspects of the platform. To ensure accuracy, the platform incorporates a feedback mechanism that continuously collects input from startups and investors regarding the actual investment returns. This feedback loop allows the deep learning model to learn from real-world outcomes and iteratively improve its predictive capabilities.

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Furthermore, the platform fosters collaboration and communication between startups and investors. It provides avenues for direct interactions, networking opportunities, and the establishment of partnerships. By facilitating these connections, the platform aims to create a vibrant startup ecosystem where innovators and financial backers can collaborate and thrive.

The benefits of the proposed platform are manifold. For startups, it offers increased visibility and exposure to potential investors, enhancing their chances of securing funding. Investors, on the other hand, gain access to an automated and data-driven approach for evaluating investment opportunities, saving valuable time and resources. Ultimately, the platform aims to bridge the gap between startups and investors, promote informed decision-making, and contribute to the growth and success of the startup ecosystem.

In conclusion, this paper introduces a web-based platform that harnesses deep learning techniques to connect startups and investors and predict investment returns. By leveraging advanced machine learning algorithms and real-time data analysis, the platform offers a comprehensive solution to the challenges faced by both startups and investors. The subsequent sections of this paper will delve into the technical details, implementation strategies, and evaluation results of the platform, providing insights into its functionality and potential impact on the startup-investor landscape.

A. Problem Statement

To enhance the process of investment suggestion for investors based on startup business details using K Nearest Neighbor and Linear regression along with Arti- ficial Neural Network and Fuzzy classification.

B. Objectives

1) To achieve effective realization of the K Nearest Neighbor clustering for the input business details.
2) To deploy the regression analysis using Linear Regression approaches.
3) To utilize deep learning methodologies for investment suggestion using Ar- tificial Neural Networks.
4) To determine the Business details for effective analysis of the startup. To cluster the data efficiently.
5) To achieve the regression analysis on extracted clusters.
6) To enhance the process of investment suggestions using deep learning method- ologies.

II. METHODOLOGY

A. System Architecture

The system architecture provides the architecture for the proposed system in the form of different layers. The User Interface layer consists of the startup and the output is the Investment Suggestions. The Data preprocessing layer consists of preprocessing. The Data processing layer is composed of KNN and Linear Regression.The intelligence layer is made up of ANN and Fuzzy Classification and the Data source is the Dataset.

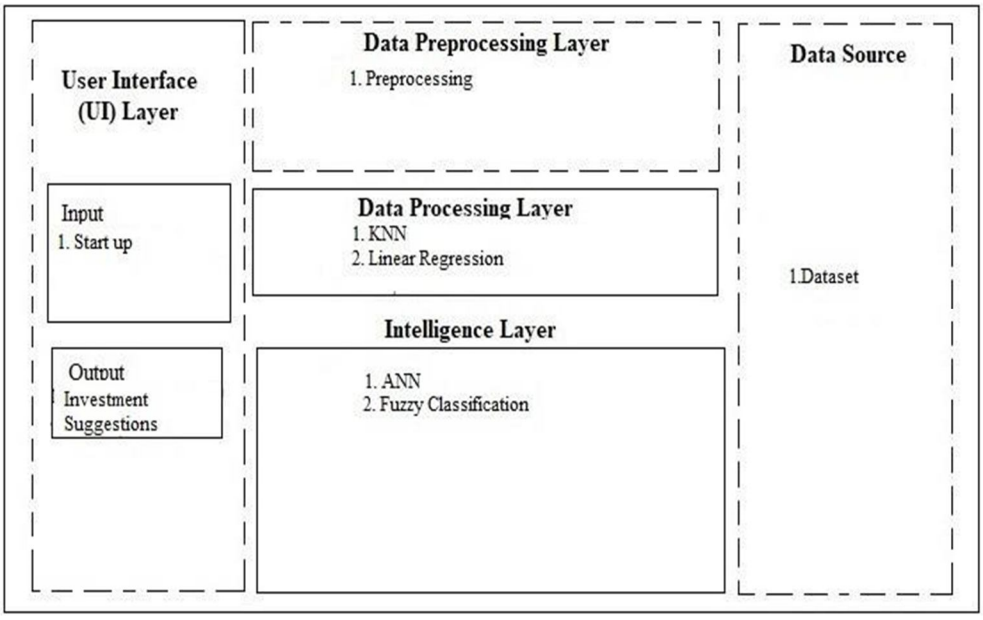


Fig. 1. System Architecture

III. RELATED WORKS

Several research studies and platforms have focused on connecting startups and investors and utilizing various technologies to enhance the investment process. This section highlights relevant related works in the field of web-based platforms for startup-investor connectivity and investment prediction.

1) *Startup-Investor Matching Platforms:* Numerous web-based platforms have emerged to facilitate the matchmaking process between startups and investors. Platforms like AngelList, Gust, and Crunchbase provide databases of startups and investors, enabling startups to showcase their businesses and investors to discover investment opportunities. These platforms emphasize networking, information exchange, and facilitating direct connections between startups and investors.
2) *Machine Learning for Investment Prediction:* Machine learning techniques have been widely applied to predict investment returns and assess startup viability. Research studies, such as "Predicting Start-up Investment Success Using Machine Learning" by Ahuja et al., have explored the use of machine learning algorithms to analyze various factors, such as financial indicators, market trends, and management attributes, to predict investment outcomes
3) *Deep Learning in Finance and Investment:* Deep learning models have demonstrated promising results in various domains, including finance and investment. Research papers like "Deep Learning for Predicting Returns and Fund Flows in Financial Markets" by Shen et al. have explored the use of deep learning architectures, such as recurrent neural networks (RNNs) and convolutional neural networks (CNNs), to analyze financial data and predict investment returns
4) *Crowdfunding Platforms:* Crowdfunding platforms, such as Kickstarter and Indiegogo, have gained popularity as avenues for startups to secure funding from a large pool of individual investors. These platforms utilize web-based interfaces to showcase startup projects, engage with potential investors, and provide transparent funding processes.
5) *Social Investment Networks:* Social investment networks, such as eToro and ZuluTrade, have leveraged web-based platforms to connect investors and facilitate knowledge-sharing and portfolio management. These platforms enable users to follow successful investors, copy their investment strategies, and engage in social interactions to enhance investment decision-making.
6) *Predictive Analytics in Venture Capital:* Venture capital firms have employed predictive analytics to improve investment decision-making. Research studies like "Venture Capital Investment Decision-Making: The Role of Predictive Analytics" by Kim et al. have investigated the use of predictive models and algorithms to assess startup potential and predict investment success.
7) *Investor Networks and Communities:* Online investor networks and communities, such as TheFunded and Startups.co, provide platforms for startups to connect with a community of investors, share experiences, and seek advice. These platforms foster collaboration, knowledge exchange, and networking among startups and investors.

The proposed methodology for the purpose of providing effective investment suggestions is initiated by the startups providing their business details which are effectively pre-processed along with the input data set. These pre-processed values are effectively clustered using the k nearest neighbour clustering algorithm. The clusters are provided for regression analysis through linear regression which is then provided for neuron generation into artificial neural networks. The probability scores achieved by the artificial urine networks are effectively classified using fuzzy classification to provide accurate investment suggestions to the investors.

IV. RESULTS

The proposed methodology for investment Suggestion based on machine learn- ing has been devised and the use of the NetBeans and Spyder IDE. The Java as well as the Python Programming language has been utilized as the programming language for this approach. The implementation laptop has a typical setup with an Intel i5 CPU, 1TB hard drive, and 8GB of RAM. The MySQL database system was utilized to manage the storage requirements .

This approach has undergone extensive assessment in order to adequately as- sess the functionality of the proposed methodology. The evaluation parameters were examined using the precision and recall concept.

Performance Evaluation based on Precision and Recall Precision and recall are two really useful ways for measuring how precisely a certain component in our framework is executed. The accuracy of the component determines its relative accuracy and includes a wide spectrum of reliability.

The precision metric in this method was computed as the ratio of the number of correct Investment Suggestions acquired to the total number of trials completed. The recall requirements, on the other hand, are an addition to the precision mea- sure and aid in determining the absolute accuracy of the Artificial Neural Network component.

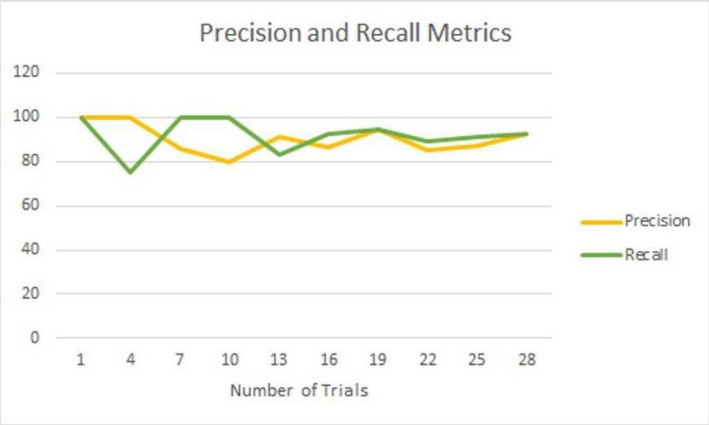


Figure 2: Comparison of Precision and Recall

V. CONCLUSION AND FUTURE SCOPE

In this paper, we presented a web-based platform that harnesses the power of deep learning to connect startups and investors and predict investment returns. The platform addresses the challenges faced by startups in securing funding and investors in identifying promising investment opportunities. By leveraging advanced machine learning techniques, the platform offers a data-driven approach to facilitate startup-investor matchmaking and enhance investment decision-making.

The proposed platform provides startups with increased visibility and exposure to potential investors, allowing them to showcase their business plans, products, and financial projections. Investors, on the other hand, gain access to a comprehensive database of startups and can utilize deep learning models to predict investment returns based on various factors and market trends. The platform also fosters collaboration and networking opportunities, creating a vibrant startup ecosystem.

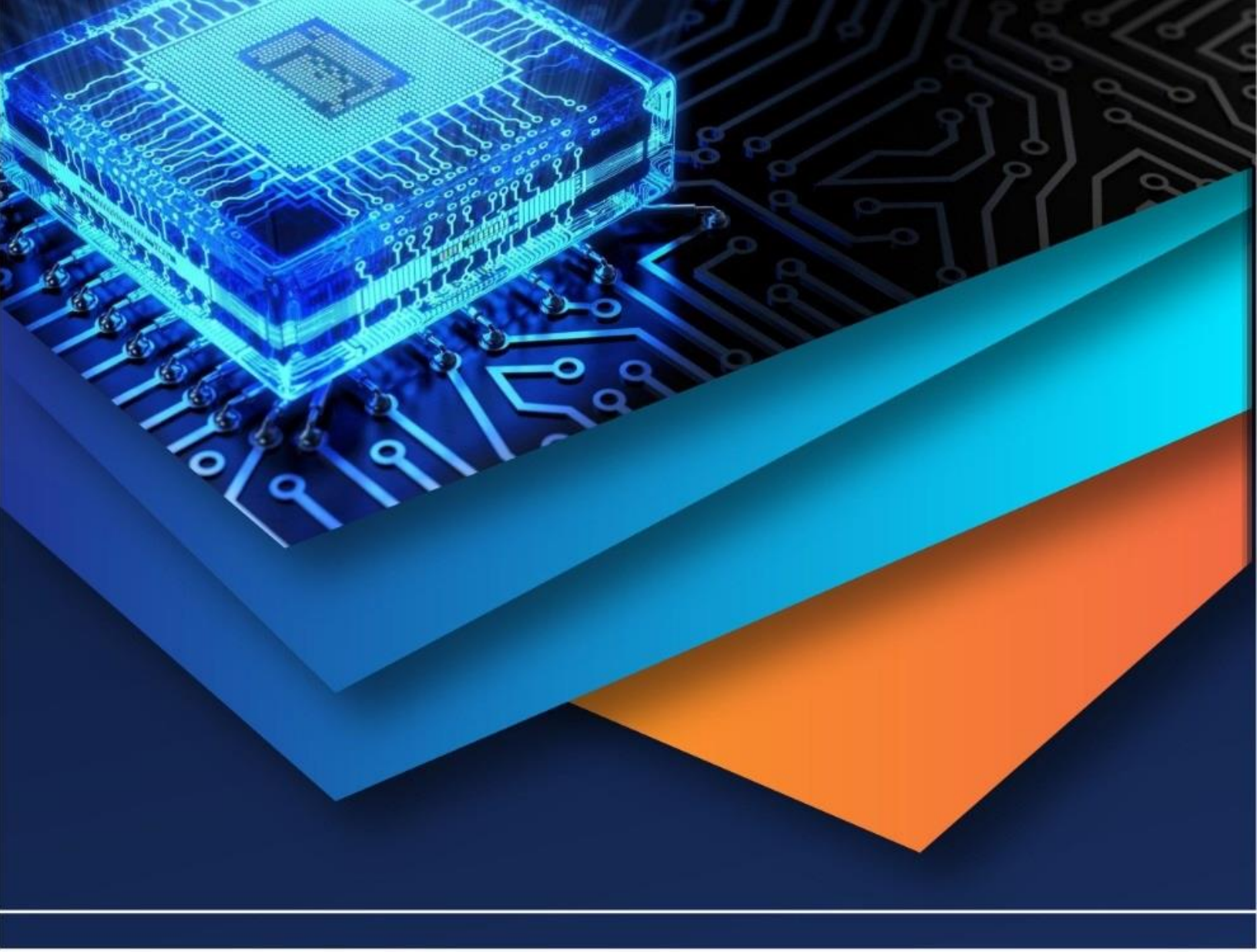
1) *Enhanced Predictive Models:* Continual improvement of the deep learning models used for investment prediction can enhance the accuracy and reliability of the platform. Exploring advanced architectures, such as attention-based models or graph neural networks, could capture more intricate relationships and improve prediction capabilities.
2) *Real-time Data Integration:* Incorporating real-time data sources, such as social media trends, news articles, or economic indicators, could provide more up-to-date information for investment predictions. Integrating sentiment analysis techniques could also capture market sentiments and investor opinions that influence investment decisions.
3) *Risk Assessment and Portfolio Management:* Extending the platform to include risk assessment tools and portfolio management capabilities can provide investors with a holistic view of their investments. Incorporating risk evaluation metrics, diversification strategies, and performance tracking features can enable investors to make informed decisions and optimize their investment portfolios.
4) .*Investor-Startup Feedback Loop:* Expanding the feedback mechanism within the platform to include post-investment data can further enhance the predictive models. Collecting and analyzing investment outcomes and performance metrics can improve the accuracy of future predictions and provide valuable insights for both startups and investors.
5) *Integration with External Financial Tools:* Integrating the platform with external financial tools, such as accounting software or financial analytics platforms, can streamline financial data analysis and improve the accuracy of financial projections. This integration can provide startups with a more comprehensive understanding of their financial performance and facilitate investor evaluation.
6) *Industry-Specific Insights:* Customizing the predictive models and platform features for specific industries or sectors can provide tailored insights and recommendations. Industry-specific data analysis and benchmarks can assist both startups and investors in understanding the unique dynamics and challenges of their respective sectors.

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