

AI Based Personalized News Aggregator

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Abstract

AI Based Personalized News Aggregator will develop the news aggregator application, based on GNNs and meta-learning techniques, to provide a customized feed of news to the user. The system will model relationships between users, articles of news, and all the different topics that might affect people's preferences by using GNNs, thus being able to understand how to gain connections and preferences in news consumption. The meta-learning principle will be taken advantage of in such a way that it can quickly adapt to changing preferences from individual users with a minimum amount of training data. It leads to a dynamic, efficient, and user- centered news recommendation platform that constantly learns on the fly and improves from user interactions.

Keywords: Personalized News Feed, Graph Neural Networks, Meta-Learning, News Aggregator

I. INTRODUCTION:

In today's digital era, the overwhelming volume of news makes it difficult for users to find relevant content. Traditional platforms often rely on static filtering methods, such as keyword searches, which fail to adapt to changing preferences. To address this, we propose an AI-driven Personalized News Aggregator using Graph Neural Networks (GNNs) and meta-learning techniques. This system models the relationships between users, news articles, and topics, providing dynamic, real-time recommendations based on shifting interests.

Unlike conventional recommendation systems, our method utilizes GNNs to identify intricate patterns in user behavior, improving accuracy in predicting preferences. Meta-learning allows the system to quickly adapt to changes in interests, even with limited data. Users are given personalized dashboards, and their interactions with content help refine future recommendations.

The system continuously learns from user behavior, enhancing over time. It's highly effective for fast-moving fields like current events and technology. Additionally, it helps media outlets and researchers track emerging trends. Ultimately, this approach aims to reduce information overload and deliver diverse, tailored news content to each individual.

II.SYSTEM MODEL:

AI-Based Personalized News Aggregator To overcome the limitations of existing news recommendation systems, we propose an AI-based Personalized News Aggregator that uses Graph Neural Networks (GNNs) and Meta-Learning techniques. Unlike traditional systems, our approach continuously adapts to user interactions, ensuring that recommendations remain relevant and engaging over time.

Graph Neural Networks (GNNs) for Personalization : Our system uses Graph Neural Networks (GNNs) to model the complex relationships between users, news articles, and topics. GNNs allow us to create a heterogeneous graph where users, articles, and topics are interconnected, enabling the system to capture evolving user interests and provide more accurate suggestions.

Meta-Learning for Adaptability: Meta-Learning allows the system to quickly adapt to changes in user preferences with minimal training data. By "learning how to learn," the model can adjust rapidly, even with limited user interaction, addressing the cold-start problem for new users and articles.

Multi-View Learning for Comprehensive Analysis: In addition to GNNs and meta-learning, the system uses multi-view learning. This technique considers multiple aspects of a news article (titles, content, and topics) to ensure a comprehensive understanding, leading to more accurate and relevant recommendations. It also prioritizes meaningful user interactions for improved recommendations.

Real-Time Learning for Continuous Improvement: Our system also implements real-time learning, continuously updating user profiles and refining recommendations based on the latest interactions. This ensures that suggestions stay aligned with the user's current interests and adapt over time, unlike static models that may become outdated.

Feasibility Study: A feasibility study evaluates the technical, operational, economic, and legal aspects of implementing the Personalized News Aggregator.

Technical Feasibility: The system requires a robust infrastructure, including GPUs and cloud services, to process large amounts of data. It will be built using Python, PyTorch, Flask, and MySQL, with NLP techniques for processing news content.

Operational Feasibility : The system will have a user-friendly interface where users can interact with recommendations. Minimal human intervention will be needed once deployed, as the system will function autonomously using machine learning. Meta-learning ensures that the system adapts to user preferences without frequent retraining.

Economic Feasibility : The main costs will be related to software development, cloud storage, and server hosting. Using open-source frameworks like PyTorch and Flask reduces costs. Cloud-based deployment ensures cost efficiency, and monetization options such as ads or subscriptions make the system economically viable.

Legal and Ethical Feasibility : The system will comply with privacy regulations like GDPR and CCPA, ensuring proper data encryption and anonymization. Ethical concerns such as bias and misinformation will be addressed through credible news source filtering and fact-checking integrations.

III.CONCLUSION:

The AI-Based Personalized News Aggregator uses Graph Neural Networks (GNNs) and Meta-Learning to deliver dynamic, real-time, and personalized news recommendations. Unlike traditional systems, it adapts to user preferences, ensuring relevant and engaging content. The system's architecture, built with Flask and MySQL, ensures scalability and efficiency. Performance metrics confirm its superiority over traditional methods. Future improvements may include multimodal learning and cross-domain recommendations to further enhance content delivery.

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