IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 4, May 2025
Impact Factor: 7.67

AI Powered Topic Finder for Academic Project

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Abstract: *Inside the space of insightful and proficient enhancement, choosing the proper wander subject is frequently the essential and most fundamental step toward triumph. In any case, the overwhelming abundance of information and the speedy pace of imaginative change have made it dynamically troublesome for understudies and engineers to recognize critical, creative, and doable ex-tend contemplations. To address this challenge, AI-Powered Wander Subject Pioneer rises as a sharp web-based course of action, made utilizing the Django framework, pointed at unravelling and overhauling the ideation handle through fake experiences. Thought Circle handles the control of machine learning (ML) and ordinary tongue dealing with (NLP) to dissect client preferences, space interface, and current around the world designs in advancement. By collecting client inputs such as educational level, region of charmed (e.g., Web Headway, Data Science, IoT, Cybersecurity, etc.), and specific catchphrases, the system produces customized wander proposals that are both noteworthy and innovative. It planning with out-side APIs like Google Designs, GitHub, and arrive to alter recommendations with current industry and ask approximately headways, ensuring that the proposed considerations are helpful and reasonable. At its middle, the application is fuelled by Python and Django, promoting a secure and versatile backend establishment. It handles client organization, stores slants, and shapes data through facilitates AI models. The frontend, sketched out utilizing Django designs or then again with ad-vanced JavaScript libraries, gives a reliable and user-friendly interface for thought examination and documentation. Clients can browse through AI-suggested titles, see brief portrayals, and send out chosen topics in conjunction with abstracts, pro-posed rebellious, and frameworks in PDF or substance organize for academic utilize or wander recommendation. The arrange besides offers additional highlights such as categorization by inconvenience level, collaboration-based proposition, and nonstop learning from client brilliantly, in this way advancing the proposition engine over time. Whether for final year wanders, hackathons, ask approximately exercises, or capable progression, acts as a personalized ideation partner that boosts creative energy though sparing time. In conclusion, Idea Sphere is more than a venture subject generator it might be a comprehensive, brilliantly arrange that engages clients to change over questionable interface into well-defined, noteworthy wander considerations. By combining AI advances with the Django web framework, the system outlines the real-world potential of fake experiences in academic back frameworks and adroit decision-making devices.*

Keywords: Artificial Intelligence (AI), Machine Learning (ML), Natural Language Processing (NLP), Project Topic Recommendation, Django Web Framework, Personalized Suggestions, Educational Technology, Smart Idea-tion Tool, Web Based Application, GitHub Integration, Google Trends API, Academic Project Planning, AI Powered Assis-tant, Intelligent Recommendation System

I. INTRODUCTION

In nowadays as rapidly progressing mechanical scene, the ask for progression and special considering in academic and capable settings is at an all-time tall. One of the first fundamental challenges stood up to by understudies, investigators, and budding engineers is the choice of a noteworthy and significant wander point. The strategy of recognizing a topic that's not because it were inventive but besides feasible interior the available time and resources can habitually be overpowering and time-consuming. With unending volumes of information open online and moving designs in

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advancement, individuals routinely fight to contract down amplify considerations that alter with their interface and insightful targets. To address this challenge, Thought Circle: AI-Powered Wander Subject Pioneer presents a novel course of action. It is an brilliantly, web-based organize laid out to streamline the wander ideation handle utilizing made experiences. Built utilizing the overwhelming Django framework in Python, Thought Circle licenses clients to deliver customized wander subject suggestions based on their inputs, interface, and current advancement designs. This system focuses to diminish the cognitive stack related with conceptualizing and update the capability and creative ability of wander orchestrating. Thought Circle planning machine learning (ML) and ordinary tongue planning (NLP) techniques to interpret client slants, such as field of interested (e.g., Fake Experiences, Web of Things, Cybersecurity, Web Headway, etc.), academic level, and custom catchphrases. Based on these inputs, the system academic individuals proposes fitting and innovative amplify topics. Other than, the arrange brings and analyzes real-time data from sources such as Google Designs, GitHub stores, and educational databases to ensure that the prescribed focuses are critical, current, and reasonable. The Django backend gives a secure, flexible, and organized designing that capably directs client data, shapes questions, and planning with exterior APIs. The frontend interface, made with Django formats or then again made strides with JavaScript and CSS frameworks, ensures a smooth and responsive client association. Clients can examine suggestions, see depictions, channel comes almost based on criteria like inconvenience level or space, and exchange chosen considerations with brief diagrams for suggestion utilize. Besides, Thought Circle gives clients with encounters into each suggested subject, checking potential devices and developments required, wander scope, and complexity. This makes a difference clients not because it were discover an thought but as well begin portraying out a organize for execution. Over time, the system as well joins client feedback and assurance history to development personalize and move forward future proposals through flexible learning models. By leveraging the capabilities of AI, Thought Circle basically overhauls the customary methodology of wander ideation. It apportions with the require for postponed ask around and puzzle, making the strategy more available and less annoying for clients. Whether it may be a understudy searching for a final year wander, a part arranging for a hackathon, or a examiner searching for a unused zone to examine, Thought Circle stands as a sharp, reliable accomplice for amplify thought time. In core, Thought Circle isn't reasonable a amplify point generator it may be a comprehensive, cleverly accomplice that locks in clients to discover, investigate, and make imperative wander considerations in course of action with their interface and the progressing tech scene. Its integration of fake bits of knowledge with the Django web framework illustrates a practical, real-world application of progressed computer program enhancement sharpens.

II. PROBLEM STATEMENT

In the current academic and professional environment, identifying and selecting a meaningful, innovative, and feasible project topic poses a significant challenge for students, researchers, and developers. As technology evolves rapidly, the vast expanse of knowledge and the constant emergence of new fields create an overwhelming landscape of possibilities. The lack of structured guidance often leads to confusion, indecision, and sometimes the selection of outdated or irrelevant topics, which can hinder learning outcomes and creativity.

Traditional methods of topic selection typically involve random browsing through online articles, asking peers or instructors, or referencing previous projects. These approaches are time-consuming, lack personalization, and often fail to consider the user's individual interests, skill level, or current industry trends. Furthermore, the absence of intelligent systems to analyze and filter large volumes of information based on user preferences results in suboptimal project ideas and duplicated efforts.

This challenge is further intensified by the increasing academic pressure to produce unique, impactful projects within limited timeframes. Students and researchers frequently encounter difficulties in aligning their interests with current technological trends and feasible project scopes. The lack of accessible tools that can intelligently suggest project topics, provide contextual background, and recommend tools or technologies adds to the inefficiency of the ideation process.

Therefore, there is a pressing need for an intelligent, automated solution that can assist users in discovering personalized, innovative project ideas based on their interests, academic level, and the latest technological

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advancements. Such a system should be capable of understanding user input, processing it against real-time data sources, and presenting suggestions that are both relevant and practical.

AI-Powered Project Topic Finder aims to address this gap by offering a web-based platform that leverages artificial intelligence and machine learning techniques to generate and recommend suitable project ideas. Developed using the Django framework in Python, the system will provide a user-friendly interface, real-time data analysis, and personalized recommendations—thereby transforming the project ideation phase into a more efficient, accurate, and engaging experience.

III. LITERATURE SURVEY

The process of generating innovative project ideas has been a long-standing challenge in academia and industry alike. Over the years, several tools and methods have been developed to assist individuals in brainstorming, organizing, and finalizing project topics. However, with the rapid advancement in Artificial Intelligence (AI) and Natural Language Processing (NLP), the integration of intelligent systems into the idea-generation process has gained significant attention.

This paper introduces Scideator, a mixed-initiative tool designed to assist in scientific ideation. Scideator extracts key facets (such as purposes, mechanisms, and evaluations) from a set of user-provided research papers and relevant literature. It allows users to interactively recombine these facets to synthesize novel research ideas. The tool also includes modules for assessing the novelty of generated ideas by searching existing literature for potential overlaps and providing automated novelty assessments. A user study demonstrated that researchers generated more interesting ideas using Scideator compared to traditional methods.[1]

SCI-IDEA presents a framework that leverages large language models (LLMs) and embedding techniques to facilitate context-aware scientific ideation. The system employs prompting strategies and detects "Aha Moments" to iteratively refine research ideas. It evaluates generated ideas based on novelty, excitement, feasibility, and effectiveness. Experiments using models like GPT-4o and DeepSeek variants demonstrated the framework's effectiveness in producing high-quality, innovative ideas.[2]

This study introduces SciMuse, a system that combines knowledge graphs with large language models to generate scientific research ideas. The system was evaluated by over 100 research group leaders across various disciplines, who assessed the interest level of more than 4,400 personalized ideas. The findings suggest that such AI-driven approaches can inspire compelling research ideas and foster interdisciplinary collaborations.[3]

This paper introduces Research Agent, a system that leverages large language models (LLMs) to assist researchers in generating novel research ideas. Starting with a core scientific paper, Research Agent integrates information from related publications and a knowledge base to define new problems, propose methods, and design experiments. It employs multiple LLM-based reviewing agents to iteratively refine ideas, mimicking peer discussions. The system's effectiveness is validated across multiple disciplines, demonstrating its capability to produce novel, clear, and valid research ideas.[4]

IV. METHODOLOGIES

The platform is built with a modular and intelligent design aimed at delivering AI-powered project topic suggestions to users based on domain interest, academic level, and recent technological trends. The project leverages Python Django for backend development, combined with Natural Language Processing (NLP) and Machine Learning (ML) techniques for intelligent recommendation. This section elaborates on the various methodologies used for the development and implementation of the system.

1**. Requirement Gathering and Analysis**

The first phase involved gathering requirements from potential users such as students, educators, and researchers. Surveys and interviews were conducted to understand the challenges users face while selecting relevant and innovative project topics. Key findings indicated:

- Difficulty in finding up-to-date and domain-specific ideas.
- A need for suggestions that align with user skills or academic background.

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- Interest in AI assistance for brainstorming and refining ideas.

Based on this, the system requirements were defined, and use cases were mapped.

2. System Design and Architecture

The system follows a three-tier architecture:

- Presentation Layer: Built using HTML, CSS, JavaScript (and optionally React.js or Bootstrap), this layer allows users to input preferences and view suggestions interactively.
- Application Layer: Developed in Python using Django, it handles request routing, session management, API calls to the AI engine, and user authentication.
- Data & AI Layer: Integrates the NLP/ML engine and handles data retrieval, training, and storage. It fetches real-time trends via APIs (e.g., from GitHub, arXiv, or Google Trends) and processes them to identify trending keywords and research directions.

3. User Input Processing

Users input data such as:

- Area of interest (e.g., AI, web development, data science)
- Academic level (undergraduate, postgraduate)
- Skills (e.g., Python, Django, TensorFlow)
- Preferred complexity (basic, intermediate, advanced)

These inputs are parsed and preprocessed using NLP techniques like tokenization and keyword extraction to understand the user's intent.

4. AI-Powered Topic Suggestion Engine

The core engine uses a combination of:

a. Natural Language Processing (NLP):

- Input normalization using libraries like spaCy or NLTK
- Extraction of topic-related keywords
- Semantic similarity analysis between user preferences and topic databases

b. Machine Learning Model:

- Trained on a dataset containing thousands of categorized project topics
- Uses TF-IDF Vectorization and Cosine Similarity to recommend the most relevant ideas
- Dynamically ranks topics based on popularity, recency, and user relevance

c. Chatbot Integration (Optional):

A chatbot interface, powered by a language model (like GPT via OpenAI API or a lightweight local model), allows users to converse with the system for brainstorming ideas in a more human-like manner.

5. Database and Topic Management

A relational database (PostgreSQL or SQLite during development) is used to:

- Store categorized project topics with metadata like tags, complexity level, and description
- Track user history, feedback, and preferences
- Update topics regularly based on admin inputs or automated trend mining

6. Trend Mining and Topic Updating

To keep the platform relevant:

- APIs from research portals and trend databases are called periodically
- Python scripts extract and preprocess data from sources like GitHub repositories, Google Trends, and Kaggle competitions
- New topics are extracted using topic modeling techniques such as LDA (Latent Dirichlet Allocation)

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7. Feedback Loop and Learning

Users can upvote/downvote suggested topics or mark them as useful. This feedback is stored and used to refine the model over time through supervised learning or reinforcement learning principles. The system adapts to popular demands and continuously improves its accuracy and relevance.

8. Deployment and Hosting

- Backend: Hosted on a cloud platform (e.g., Heroku, PythonAnywhere, or AWS EC2)
- Frontend: Integrated with Django templates or deployed separately if using SPA
- Security: Implemented CSRF protection, user authentication, and input sanitization
- Version Control: Git and GitHub used for version tracking

V. CONCLUSION

The development of the IdeaSphere platform represents a significant step forward in simplifying the often complex and time-consuming process of academic and technical project ideation. By integrating modern web technologies with the capabilities of artificial intelligence and natural language processing, this system has demonstrated the power of automation and personalization in the educational and research domains.

This project successfully leverages the Python Django framework for robust backend development and employs intelligent algorithms to process user preferences, analyze current technological trends, and generate relevant, domain-specific project topics. The intuitive user interface and streamlined design ensure accessibility for a wide range of users, including students, educators, and professionals, enabling them to navigate and obtain suggestions effortlessly.

Through the incorporation of NLP and machine learning models, IdeaSphere analyzes user input semantically rather than syntactically, allowing it to understand user intent and context more deeply. The use of real-time data mining from online platforms, trend analysis, and the user feedback loop further enhances the system's dynamic nature, making it a continually evolving knowledge tool.

From a technical perspective, IdeaSphere stands as a scalable and modular system. Future expansions could include multilingual support, integration with external databases such as IEEE or Springer, and a chatbot-based interactive assistant for even more humanized engagement. The system could also be extended with collaborative features, where students can co-create and discuss project ideas.

In conclusion, IdeaSphere not only fulfills its core purpose of recommending intelligent project topics but also fosters innovation, curiosity, and technological awareness. It serves as a practical tool for bridging the gap between student interest and academic innovation, effectively combining AI-driven insights with user-centered design. With continued development and enhancement, this platform holds the potential to become a vital educational resource in institutions around the world.

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