

A Literature Survey on Modern Heuristic Optimization with AI Applications

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Abstract : A purpose of this study was to assess the impact of Artificial Intelligence (AI) on education premised on a narrative and framework for assessing AI identified from a preliminary analysis, the scope of the study was limited to the application and effects of AI in administration, instruction and learning. Here the implementation of this research work is on AI powered web based/distributed cloud software or a Web application to analyze the optimal use of AI tools instead of Traditional searching methodologies. Much of the research covered in this review could be applicable to developing strong AI. In particular, this paper provides a full review of recent developments within the field of artificial intelligence and its applications. The work is targeted at new aspirants to the artificial intelligence field. It also reminds the researchers about some issues they have already known, thereby improving learners experience and overall quality of learning.

Keywords— AI, Neural Network, Business Efficiency, Genetic Algorithms, Fuzzy Logic

I. INTRODUCTION

The father of Artificial Intelligence, John McCarthy states a definition for AI which says that “Artificial Intelligence is the science and engineering of making intelligent machines, especially intelligent computer programs”.

The term Artificial Intelligence can be defined as “Developing Computer programs to solve complex problems by applications of processes that are analogous to human reasoning processes. Artificial Intelligence (AI) is intelligence exhibited by machines. In computer science the field of AI defines itself as the study of “intelligent agents”. Generally, the term “AI” is used when a machine simulates functions that human’s associate with other human minds such as learning and problem solving. In the last few years, there has been an arrival of a large amount of software that utilizes elements of artificial intelligence. Subfields of AI such as Machine Learning, Natural Language processing, Image Processing and Data mining have become an important topic for today’s tech giants.

Artificial Intelligence is an approach to make a computer, a robot, or a product to think how smart humans think. AI is a study of how the human brain thinks, learns, decides and works, when it tries to solve problems. And finally this study outputs intelligent software systems. The aim of AI is to improve computer functions which are related to human

knowledge, for example, reasoning, learning, and problem-solving.

The intelligence is intangible. It is composed

- Reasoning
- Learning
- Problem Solving
- Perception
- Linguistic Intelligence

The objectives of AI research are reasoning, knowledge representation, planning, learning, natural language processing, realization, and ability to move and manipulate objects. There are long-term goals in the general intelligence sector.

Approaches include statistical methods, computational intelligence, and traditional coding AI. During the AI research related to search and mathematical optimization, artificial neural networks and methods based on statistics, probability, and economics, we use many tools. Computer science attracts AI in the field of science, mathematics, psychology, linguistics, philosophy and so on.

II. LITERATURE REVIEW

Artificial Intelligence can transform almost every industry but one of the major challenges of Artificial Intelligence is the lack of a clear implementation strategy. In order to be successful a strategic approach needs to be established while implementing AI. This work grew out of the challenges that AI possesses in view of the rise and growing nature of information technology worldwide that has characterized business- and non-business organizational development (Barclay et al. (2002), Baxter et al. (2001), Darwin and Marquis (2002), Gao and Culbertson (2002), Tennenholtz (2002) and Wiewwiora (2003)).

The necessity for research in AI is being motivated by two factors that are (i) to give the new entrants into the AI field an understanding of the basic structure of the AI literature (Brooks (2001), Gamberger and Lavrac (2002), Kim (1995), Kim and Kim (1995), Patel-Schneider and Sebastiani (2003) and Zanuttini (2003)). As such, the Literature there discussed here answers the common query, “why must I study AI?” (ii) the upsurge of interest in AI that has prompted an increased interest and huge investments in AI facilities.

i. Problem Formulation

The Web Applications or The modern generation distributed softwares which provides software as a service architecture faces lack of modern implementations over the traditional approach of static web apps or web services

The today's arena faces lack of employment issues with this aspect enterprises face the issue of providing reliable solutions for the clients and employees the major issues with the traditional approach of company and vendors businesses.

ii. Objective

Here we present the modern approach for the web application to implement huratics searching techniques to build an intelligent architecture to process and large scale data set and provide optimal solution or the recommendation to the client.

The first main objective is to develop a web application which provides modern User interfaces and reliable user experience for naive users or clients who have no technical knowledge. The other objective is to provide human resources from remote places.

Providing all in one integrated environment for the clients which offer them to showcase there services and talents work in our platform and generates revenue from the services or from products. Developing the tools for various remote areas. It will also improve the energy efficiency of the peoples.

The cluster of these raw services is given as input to the recommendation Engine which has an algorithm for this particular segment . As per the similar entries and their neighbour entries are compared with the given entries which are the services where clients recently visit or show interest in it and those relative services and related content are predicted to clients.

Recommendation systems are quickly becoming the primary way for users to expose to the whole digital world through the lens of their experiences, behaviours, preferences and interests. And in a world of information density and product overload, a recommendation engine provides an efficient way for companies to provide consumers with personalised information and solutions.

B. In broad terms, how does the Recommendation Engine work

Recommendation engines need to know you better to be effective with their suggestion. Therefore, the information they collect and integrate is a critical aspect of the process. This can be information relating to explicit interactions, for example, information about your past activity, your ratings, reviews and other information about your profile, such as gender, age, or investment objectives. These can combine with implicit interactions such as the device you use for access, clicks on a link, location, and dates as per fig2.

III. PROPOSED SYSTEM/METHOD

A. RECOMMENDATION ENGINE/SYSTEM IN THE A.I

A recommendation engine is a system that suggests products, services, information to users based on analysis of data. Notwithstanding, the recommendation can derive from a variety of factors such as the history of the user and the behaviour of similar users.

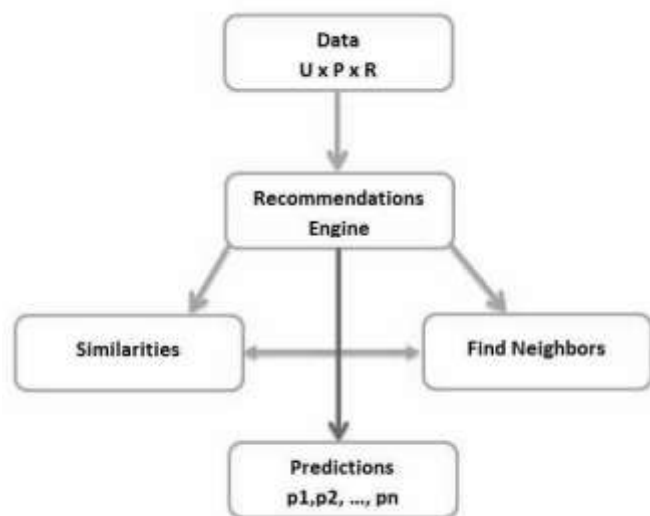


fig1.Recommendation process

As per fig 1 the services data from the web module is get clustered into the processing unit here in our project the data for the recommendations are services and resource products.

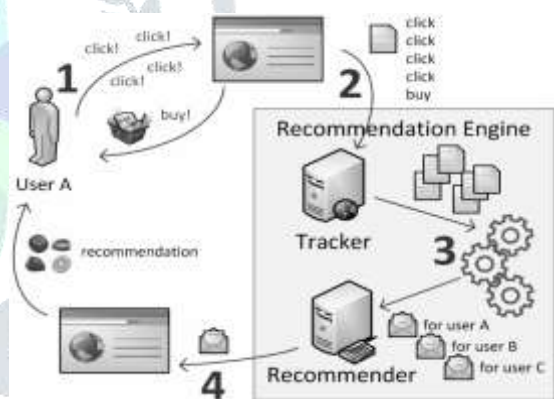


fig.2 Process flow

1) Content-based filtering:

Content-based filtering is based on a single user's interactions and preference. Recommendations are based on the metadata collected from a user's history and interactions. For example, recommendations will be based on looking at established patterns in a user's choice or behaviours. Returning information such as products or services will relate to your likes or views. With an approach like this, the more information that the user provides, the higher the accuracy.

2) Collaborative filtering:

Collaborative filtering is another commonly used technique. Collaborative filtering casts a much wider net, collecting information from the interactions from many other users to derive suggestions for you.

3) Knowledge-based system:

Knowledge-based systems are systems where suggestions are based on an influence about a user's needs and based on a degree of domain expertise and knowledge. Rules are defined that set context for each recommendation. This, for example, could be criteria that define when a specific financial product, like a trust, would be beneficial to the user. These do not, by default, have to use interaction history of a user in the same way as the content-based approach is, but can include these as well as customer products and service attributes, as well as other expert information. Given the way the system is built up, the recommendations can be easily explained. But building up this type of framework can be expensive. It tends to be better suited to complex domains where items are infrequently purchased or hence, data is lacking. Given this, it doesn't suffer the same cold-start up problems as others above.

C. What are the common challenges a Recommender System faces?

1. Sparsity of data. Data sets filled with rows and rows of values that contain blanks or zero values. So finding ways to use denser parts of the data set and those with information is critical.
2. Latent association. Labelling is imperfect. Some products with different labelling can be ignored or incorrectly consumed, meaning that the information does not get incorporated correctly.
3. Scalability. The traditional approach has become overwhelmed by the multiplicity of products and clients. This becomes a challenge as data sets widen and can lead to performance reduction.

D. Informed (Heuristic) Search Strategies

To solve large problems with a large number of possible states, problem-specific knowledge needs to be added to increase the efficiency of search algorithms.

Heuristic Evaluation Functions

They calculate the cost of the optimal path between two states. A heuristic function for sliding-tiles games is computed by counting the number of moves that each tile makes from its goal state and adding these numbers of moves for all tiles.

Pure Heuristic Search

It expands nodes in the order of their heuristic values. It creates two lists, a closed list for the already expanded nodes and an open list for the created but unexpanded nodes.

In each iteration, a node with a minimum heuristic value is expanded, all its child nodes are created and placed in the closed list. Then, the heuristic function is applied to the child nodes and they are placed in the open list according to their heuristic value. The shorter paths are saved and the longer ones are disposed of.

A * Search

It is the best-known form of Best First search. It avoids expanding paths that are already expensive, but expands most promising paths first.

$f(n) = g(n) + h(n)$, where

- $g(n)$ the cost (so far) to reach the node
- $h(n)$ estimated cost to get from the node to the goal
- $f(n)$ estimated total cost of path through n to goal. It is implemented using a priority queue by increasing $f(n)$.

- Algorithm: Best First Search

1. Start with OPEN containing just the initial state
2. Until a goal is found or there are no nodes left on OPEN do:
 - a. Pick the best node on OPEN
 - b. Generate its successors
 - c. For each successor do:
 - i. If it has not been generated before, evaluate it, add it to OPEN, and record its parent.
 - ii. If it has been generated before, change the parent if this new path is better than the previous one. In that case, update the cost of getting to this node and to any successors that this node may already have.

example of BFS:

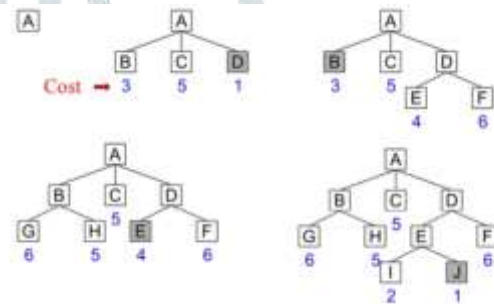


fig3. Example of BFS

As per above diagram At each step of the Best First Search process; we select the most promising of the nodes we have generated so far.

Implementation of OR graphs

We need two list of nodes:

- OPEN — nodes that have been generated and have had the heuristic function applied to them but which have not yet been examined. OPEN is actually a priority queue in which the elements with the highest priority are those with the most promising value of the heuristic function.
- CLOSED — nodes that have already been examined. We need to keep these nodes in memory if we want to search a graph rather than a tree, since whenever a new node is generated; we need to check whether it has been generated before.

here , we implements this searching techniques of our knowledge base this set is present in the form of services in the databases on the web module

E. WEB MODULE IMPLEMENTATION

Need Own Freelance Writing Website:

1. our website is our portfolio
2. Our website showcases us as professionals.
3. our website will help us to land clients.

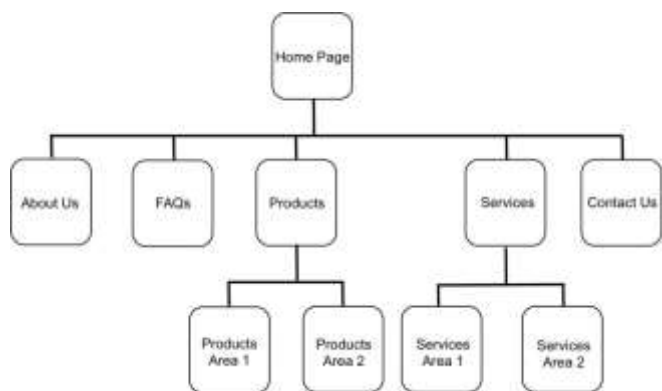


fig4: basic site layout

As shown in in fig 4 this an relative layout of the site which is an base of our platform where clients are interact to the system as the major objective of this project to make more reliable platform which is highly simplified user interface and user experience we select the web platform which is cross platform technology available on every digital devices throughout the globe as compared to desktop versions workspaces.

Implementing file structure:

File structure is a very important factor for a web platform which is a major issue faced by major tech service providers to store this numerous amount of data created by the users on the server in structured form.

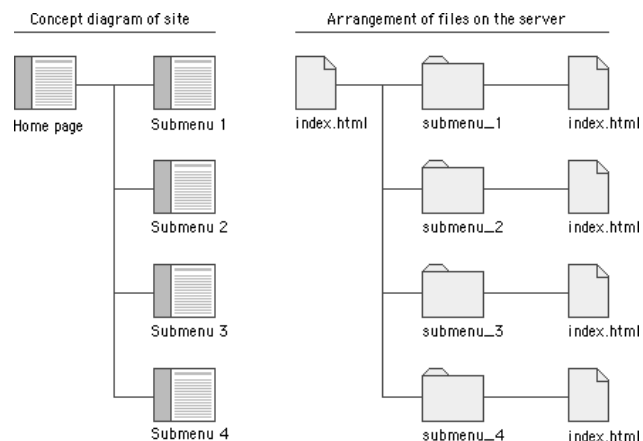


fig 5.file structure

Implementation of Dynamic site:

A dynamic site is one that can generate and return content based on the specific request URL and data (rather than always returning the same hard-coded file for a particular URL). Using the example of a product site, the server would store product "data" in a database rather than individual HTML files. When receiving an HTTP GET Request for a product, the server determines the product ID, fetches the data from the database, and then constructs the HTML page for the response by inserting the data into an HTML template. This has major advantages over a static site:

Using a database allows the product information to be stored efficiently in an easily extensible, modifiable, and searchable way.

This platform is mainly based on this client server 3 tier architecture.

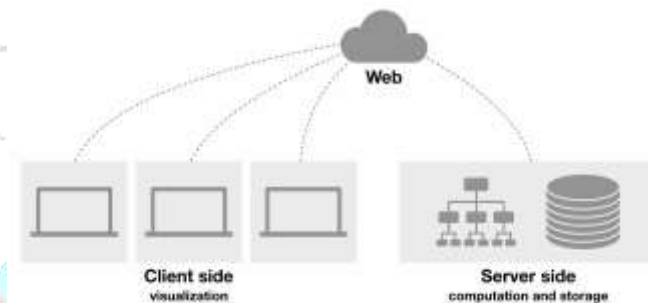
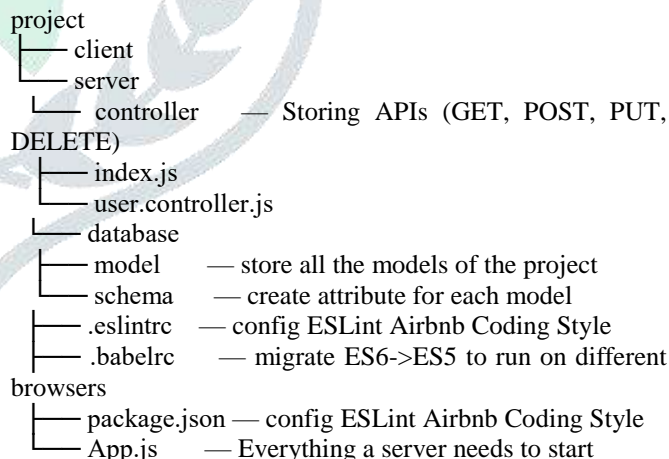


fig 7.client server architecture

project structure Implementation:



Basic fetching mechanism Implementation:

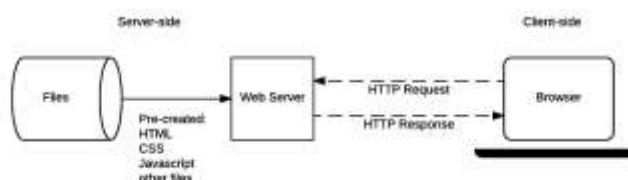


fig.8

The client makes an http request to the web server for a particular platform site with the url Ex. www.example.com and this get request is sent to the server then the server returns the homepage of a platform as a response.

As of now the web module is implemented which is an landing platform for the clients where client search for an particular service for them where they can be providing their contribution of work they would able to make a self portfolio on the site to showcase their work on the site and for hiring clients it is easy to hire these freelancer on the basis of rating and platforms analytical services which will be proving by the platform

Implementation of Integrate web module with Searching module:

we ready with the web platform and analytic now with the first two modules that is recommendation and searching module which integrate together and deploy by the following process the platform is in the production state.

Steps To Embedding AI in Your Enterprise App

Step 1: Start with APIs

The first step that you should take as a brand that is new to the world of AI, is integrated AI-based APIs in your current web applications. Make your current enterprise app intelligent by integrating them with APIs that work around image pattern recognition, NLP, speech to text, language understanding, etc.

Step 2: Develop and Deploy a Custom AI platform in Cloud

This step consists of acquiring the data from a number of present sources and then implementing them in a tailor-made machine learning platform. This requires the creation of data processing structures, identifying the right algorithms, testing and training those machine learning prototypes, and lastly, deploying them for production.

ML as Service takes the data and reveals the end model as an API endpoint. The advantage of this lies in using cloud infrastructure for testing and training the models. Using this, users would spin up the infrastructure that is powered by the advanced hardware setup that is based on FPGAs and GPUs.

Step 3: Run AI Platforms On-Premises

Once your enterprise app reaches a stage that it now requires customization to a great extent and needs to comply with policies related to data security, it is time to run an open-source AI platform with the help of your team, in-house.

IV. CONCLUSION

This paper is based on the concept of artificial intelligence, areas of artificial intelligence and its techniques. The field of artificial intelligence gives the ability to the machines to think analytically, using concepts.

Here we successfully implement the AI technology by using AI heuristic searching techniques on the web application

platform to optimise and implement the Informed (Heuristic) Search Strategies on web services.

This technology and its applications will likely have far-reaching effects on human life in the years to come. This review has not attempted to detail all the literature in the area but to report mainly the most recent work.

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