
ISSN: 2321-2152
IJMECE
International Journal of modern
electronics and communication engineering
E-Mail
editor.ijmece@gmail.com
editor@ijmece.com
www.ijmece.com

ISSN2321-2152www.ijmece.com

Vol 10, Issuse.1March 2022

IR using A*algorithm to Improve Performance

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ABSTRACT

Those days are gone. An important role is played by information retrieval. To retrieve information from a variety of sources, researchers use a procedure known as information retrieval (IR). It could be a document, image, Meta data, music, or any other type of data. Information retrieval (IR) is not just about searching, but also about the representation of information, data storage, and knowledge structure. There is, however, a difference between the information and the data. The phrase "information" refers to data that has been organized and processed, whereas the term "data" refers to data that is raw and unprocessed and has no particular significance. The term "Big Data" refers to the vast amounts of data. As well as being organized, it's also chaotic. That information necessitates the application of sound methods and strategies. Because the raw data is unstructured, managing the data, controlling and storing that data is cost-effective. In order to accomplish this, this paper employs artificial intelligence (AI) methods. It is more efficient, precise, and cost-effective than earlier methods.

INTRODUCTION

Artificial intelligence refers to the ability of machines or software to think for themselves (AI). Our minds take in information about our surroundings and make decisions depending on what we see. Artificial neural networks are also used by intelligent agents in artificial intelligence to learn about their environment and make judgments. Some subfields of AI study may not be able to communicate well with one other. Artificial intelligence (AI) tools assist in the solution of a problem by utilizing subfields in other fields of study. The components of artificial intelligence include knowledge, reasoning, learning, planning, NLP (for communication), perception, and the capacity to move and manipulate objects. Artificial Intelligence's primary goal is to create intelligent systems that mimic the human brain's functions. There are a lot of ways in which Big Data can be defined, including

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social media, email, customer and business transactions, user-generated material like images and videos, GPS-equipped mobile phones, social networking apps (Facebook, WhatApp, etc.), and system logs of all types.Todayithasbecomeanessentialpartofthe technology industry, providing the heavy lifting formany of the most challenging problems in computerscience.Todayitbecomesanessential partofthe hard work for the most difficult computer science challenges in the technology business. As a result, "Big data" refers to the constant flow of digital information that these sources provide. Big data will have a direct impact on an organization's bottom line. Improve customer, employee, partner, and operational understanding with the help of big data. Despite its high value, it was out of reach for most enterprises because to the unstructured data, infrastructure, and additional costs it entailed.

Big Data deployment necessitates a grueling and time-consuming overhaul of every department in a company, as well as the ability for users across the organization to work with a wide range of data sets using self-service tools in order to achieve Big data productivity. As a result of Big Data's acceptance,

In the past, data analysis was viewed as a separate entity and not given the same level of importance as other aspects of the organization. Big data analysis not only makes it easier for the organization to have a deeper knowledge, but it also opens the door to other possibilities.

For the most part, the job of a data scientist is to transform raw data into usable information that can be used to identify and solve the demands of customers, operational hazards, and performance possibilities inside a business and its extended supply chain.The main aim of this paper is to retrieve the largeamountsofinformationwithefficientmann erusing AI toolsandtechniques.There are manysearch techniques in Artificial Intelligence. Thoseare

1) Informedsearchtechnique
2) Uninformedsearchtechnique

Informed search: In the case of Informed searchtechnique, it has additional information related togoal state which helps more efficient in searching.It compulsory gives the solution and it is smart tovisit nodes.

Uninformedsearch:InthecaseofUninformedse arch technique, it need not have any additionalinformation related to goal state.It may or maynot give the solution. It is blind search to visit thenodes.

Therefore compare to uninformed search technique,informedsearchtechniqueisbetterin caseofperformance.Therearesevеraltechnique sunderinformedsearch techniques.Thoseare

- Bestfirstsearch
- Greedybest firstsearch
- A*search
- Hillclimbingsearch
- Constraintsatisfactionproblem.

- Generateandtest
- Meansendanalysis
- Problemreduction

Among these, we should use A* search for retrievalof information. A*is a best algorithm in informedsearchtechniquesorheuristicsearchte chniques.

I. PROPOSEDSYSTEM

The proposed system is consistsoffollowingsteps.

1) Inputtheuser query.
2) ApplytheArtificialIntelligencebasedalg orithm
3) Returningthedatafile.
4) Inputtheuserqueryto theexpert system

5) Analyzer:Searchingtheuserqueryif itwasexistedin thehistoricalfile ornot
6) Returntheresults.

Thereareseveralphases inthissystem.theabovestepsareexplained in thesephases.
Phase 1: This phase includes select the databasefile that is to be inputted to the AI algorithm. Theinputted database file can be contained any typeofdata.
Phase2:Thisphasecomprisestheselectionofthe bestartificialintelligencesearchalgorithm.The AI basedsearchalgorithmdependsonthebestinfor medsearchtechniquethroughtheproblemsolvi ngagent.

Ininformedsearch,aheuristicorguessisusedasa guide that is for better performance to get thegoalstate.Insteadofvisitingthesearchtreebli ndly, perform evaluation function at each andevery node. Based on the evaluation function visitthe best node then go best next. This node path isthen expanded and the process is repeated until togetthegoalnode.ForthisprocesspreferA*Sear chalgorithm.It isaform ofBestfirst search.

Inordertomovetowardsthegoal,theevaluationf unctionmustestimatesthecost,toreach the closest goal state from a given state.This can be done based on some knowledge aboutthe problem domain. The best first search and A*searchfollowsDFSprocedureinternallyfroms tartingnodeonwards.
Phase 3: In this phase, it displays the results oftheAIbasedalgorithm.

Phase 4: Here the users entering the query to theexpertsystem.
Phase 5: This phase comprises analyzing the userquery,iftheuserqueryexistsornotinthehist oricalfile.
Phase6:Itisthefinalphaseconsistsofdisplaying the answers to the query through theexpertsystemandsavingthatuserqueryinhis torical file and then return the query answer totheuser.

Ourmethodologyisbasedontheintelligentagent s.Theagentobservestheenvironmentthrough sensors and acts upon theenvironmentusingactuatorsanddirectsitsac tivitytowardsachieving the goal. In this model we are using thetwotypes ofagents. i.e.,

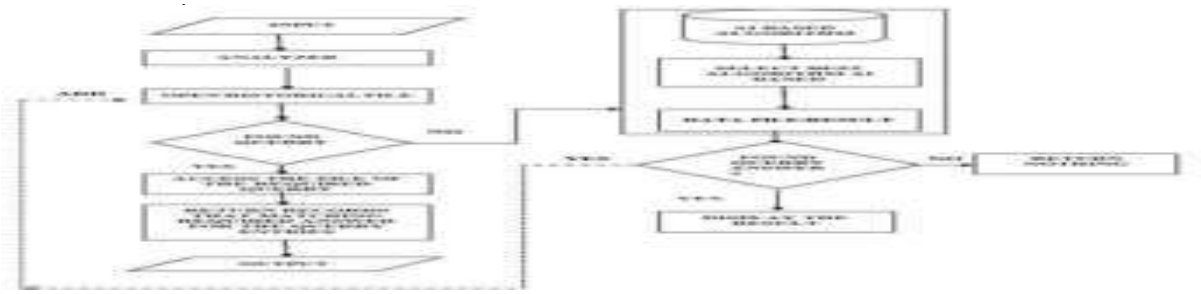
- **Modelbasedagents**
- **Goalbasedagents.**

A model-based agent can handle only a partiallyobservableenvironment.Itscurrentstat einformationisstoredinsidetheagent.Thisknow ledgeisabout"howtheworldworks"iscalled a model of the world, hence its name is"model-basedagent".

Similarly the goal-based agents further expand onthe capabilities of model-based agents, by using the"goal" information. Goal information describes thesituations that are desirable. It allows the agent toselect the best possibility to reach the goal state.Basically the main objective of using agents is tokeep track of the world state as well as a set of goalsare trying to achieve a goal and chooses the bestactionthat will lead to achievingthegoal.

ALGORITHM

SIMPLE-PROBLEM-SOLVING-AGENT(PERCEPTS)



Goal State, a goal, initially anull Problem, a problemformulation
States←UPDATE_STATE(state,percept)
ifsequenceis emptythen do
Goal_ State ← FORMULATE –GOAL (state)Problem←FORMULATEPROBLEM(states,
Goal_State)
Sequence← SEARCH (problem)Action ← FIRST (sequence)Sequence← REST (sequence)returnaction

Problem:-A problem can be defined formally by thefive components:

Initialstate:- Itisaninitial stateofanagent.

Actions:-

Acleardescriptionofthepossibleactionsavailabl etoanagent.Givenaparticularstatecalled„s",ACTIONS(s)returnsasetofactionsthatcan beexecuted instate "s".

Transition model: It tells what action is done incurrent state and that reflects to which particularnextstateamongnumbersofnodes.Its pecifiedby a function RESULT (state, action) that returnsthe state that results from doing some action "a" instate current state "s". Here we will also use theterm called successor which refers the next statefromthecurrentstatebyperformingsomep ossibleaction "a".

State space:-The set of all states reachable fromthe initial state to goal state.Initial state, actions,and transitions implicitly define the state space ofthatproblem.

The state space forms a Graph or network whichhaving the sates, links from one node another andactionsupon thelinks.

Function

RECURSIVE-BFS(problem)return a solution, or failure RBFS(problem,MAKE-NODE(INITIAL-STATE[problem]),∞)
FunctionRBFS(problem,node,flimit)
returnasolution, or failureand anew fcostlimit
If GOAL –TEST [problem] (state) thenreturnnodeSuccessor←EXPAND(node,problem)
Ifsuccessorisemptythenreturn failure,∞
For each sin successorsdof[s]←max(g(s)+h(s),f[node])Repeat
best← the lowest fvalue node insuccessors if f[best] >flimitthen returnfailure,f[best]
alternative←thesecondlowestfvalueamongsuccessors
result,f[best]←RBFS(problem,best,min(flimit,alternative))
ifresult≠failurethenreturn result

The recursion stack is kept in tact. Extensive visualization showing all the nodes that lead from the current node to the desired destination, as well as the cost of the best node in each subtree that lies below the current node. This method is repeated if the current node exceeds the cost of a node in a previously extended tree, and the algorithm returns to its deepest common ancestor. For each subtree derived from the current search route, this method retains an individual threshold value.

RBFS or A* are the best (if the heuristic can be accepted) and most resilient solutions, but their low memory profiles lead to excessive node regeneration and a consequently long processing time. However, if given sufficient time, it is capable of resolving issues.

II. CONCLUSION

The potential for Big Data's usage in the future, aided by AI, is quite promising. Machines and computers that are far more advanced than those currently in use could be created using artificial intelligence. As the amount of data grew, researchers worked tirelessly to process it and turn it into valuable resources. The computer of the future will be able to perform any task. The Speech recognition systems will be able to converse with humans, utilizing text and speech, in unstructured English, at a considerably higher degree of performance. Expert system applications will have a bright future in all parts of healthcare, including clinical and administrative domains, in the future.

enhancing the health of patients and the distribution of financial, social, and other

resources. But when it comes to the topic of building machines that are more intelligent than humans, no one seems to have an answer.. In addition, even if it is conceivable, it is impossible to anticipate how long it will take. Learning through perception, cognition, and experience is also expected to be included in the system.

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