

APPLICATION OF ARTIFICIAL INTELLIGENCE IN COGNITIVE SCIENCE

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ABSTRACT

In this paper we propose to develop some cognitive science by using Artificial intelligence which could be useful for several organisations . Organisations main aim is to create surplus . In profitable organisations surplus determines profit . In non-profitable organisations surplus determines customer satisfaction, trustworthiness etc.. Using Artificial intelligence, we can apply Cognitive science in business to increase profit. We can advertise products in best way and arrange stores to boost sales . One of our main topics will be decision support systems . Decision making process is very important in every organisations . Thus we have to consider the knowledge acquisition stage which is known as the bottleneck in the construction of these systems. We will present a model for learning strategies established by a decision maker for a feature task of categorical judgement of objects described by several attributes . It has been improved for several divisions of organisations to make decision like which sector contributes more , which sector has major problem etc . This Knowledge will be helpful for the organisations to make a decision and plan about advertisement of products and productivity to increase surplus(profit).

Keywords: Artificial intelligence , cognitive science, organisation ,surplus , decision making , knowledge acquisitions.

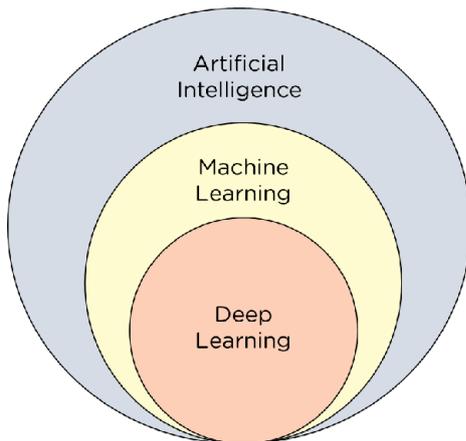
INTRODUCTION:

Since the invention of computers or machines, their capability to perform various tasks went on growing exponentially. Humans have developed the power of computer systems in terms of their diverse working domains, their increasing speed, and reducing size with respect to time. A branch of Computer Science named *Artificial Intelligence* pursues creating the computers or machines as intelligent as human beings. According to the father of Artificial Intelligence, John McCarthy, it is "***The science and engineering of making intelligent machines, especially intelligent computer programs***". Artificial Intelligence is a way of **making a computer, a computer-controlled robot, or a software think intelligently**, in the similar manner the intelligent humans think. **Artificial intelligence (AI)**, sometimes called **machine intelligence**, is intelligence demonstrated by machines, in contrast to the **natural intelligence** displayed by humans and other animals. In computer science AI research is defined as the study of "intelligent agents": any device that perceives its environment and takes actions that maximize its chance of successfully achieving its goals. Machines can often act and react like humans only if they have abundant information relating to the world. Artificial intelligence must have access to objects, categories, properties and relations between all of them to implement knowledge engineering. Initiating common sense, reasoning and problem-solving power in machines is a difficult and tedious task.

ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING:

“ *MACHINE LEARNING IS A SUBSET OF ARTIFICIAL INTELLIGENCE*”.

Artificial Intelligence (AI) and Machine Learning (ML) are two very hot buzzwords right now, and often seem to be used interchangeably.



Both terms crop up very frequently when the topic is **Big Data**, analytics, and the broader waves of technological change which are sweeping through our world. In short, the best answer is that:

Artificial Intelligence is the broader concept of machines being able to carry out tasks in a way that we would consider “smart”. And, Machine Learning is a current application of AI based around the idea that we should really just be able to give machines access to data and let them learn for themselves.

Machine Learning is the learning in which machine can learn by its own without being explicitly programmed. It is an application of AI that provide system the ability to automatically learn and improve from experience. Here we can generate a program by integrating input and output of that program. One of the simple definition of the Machine Learning is “*Machine Learning is said to learn from experience E w.r.t some class of task T and a performance measure P if learners performance at the task in the class as measured by P improves with experiences.*”

COGNITIVE SCIENCE:

Cognitive science is the interdisciplinary study of mind and the nature of intelligence.

Cognitive science is the science of cognition, which includes such things as:

- perception
- action
- learning

- memory
- attention
- reasoning
- decision-making
- language use.

I predict that at some point in the future, cognitive science will be regarded as one of the ‘basic’ sciences, in line with physics, chemistry, and biology. • Indeed, I believe that cognitive technology is going to be the next ‘revolution’ in technology. • We will have Cogno-Engineering (autonomous intelligent machines, brain interfaces) ... and Cogno-Ethics!. Cognitive Science can be used to analyze, describe, predict, or even correct, augment, if not create minds. Some specific applications are:

- Cognitive Modeling
- Human Computer Interaction
- Artificial Intelligence
- Cognitive Robotics
- Cognitive EngineeringCognitive

Science can be seen as the study of mind, but these minds can be:

- human minds
- animal minds
- computer minds
- robot minds
- alien minds
- group minds
- or whatever minds .

In practice, human mind is studied mostly.In this Human mind is studied.For this paper Reviews and Ratings of peoples can be taken into account to read peoples mind .

STATEMENT OF THE PROBLEM:

For any organizations , company or any business peoples understanding customer’s mind is very important but making conversation with each customer and understanding their mind is bad idea . Clearly, the nature of our mind has a lot to do with the nature of our brain, and studying the anatomy and workings of the brain can provide us insight about the mind ,but what exactly is the relationship between the mind and the brain? Are they

the same? Does knowing everything about the brain tell us everything about minds? Do all minds even require brains?

Now a days customers post their reviews in respective webpage about a product so that owners or business peoples came to know Customer's perception . Knowing customer's wish ,issues and perceptions is important to improve their profit . By knowing customer's wish they can understand which product has good market and which product has bad market , which product needs advertisement to improve its market , which sector in an organization has problems and solution to solve etc . Since all Organization's aim is to improve surplus(profit) . Profit is based on our customers , so Understanding Customer's need is a basic thing.

COGNITIVE SCIENCE IS FUNDAMENTAL TO BUSSINESS GROWTH:

Most people who run businesses fail to understand the importance of applying an understanding of the cognitive sciences within their businesses. They do not realise that success in every aspect of what they do – from customer understanding, team management and supplier relationships through to self management and strategic thinking – is built on varying degrees of understanding the nature of the human mind.

The problem with this lack of understanding is that without being able to use the cognitive sciences as a tool kit, the modern leader is operating half-blind. Most do not get formally taught about psychology, neuroscience or any of the other cognitive sciences – let alone how to apply them to do better in business.

The competitive environment increasingly requires you to have a new form of competitive advantage, and services which apply the cognitive sciences to business, enabling fast learning and change are arising to help busy executives without becoming a burden on their time.

COGNITIVE SCIENCE IN ARTIFICIAL INTELLIGENCE:

The study of the human mind and its functions particularly looks at behavior in a given context. This means that you can better understand why people act as they do, and have a better chance of predicting behaviors. How will customers respond to the new product? Will the team be more productive with the proposed changes in their work space? How will our new negotiating position on supplier contracts impact existing relationships?

Our improved understanding of the structure of the nervous system and function of the nervous system and the human brain may not seem relevant until you understand that people are emotional creatures that learnt to think, rather than thinking creatures that have emotions. Why do you find it hard to multi-task? How can you better focus on your strategic creativity, decision-making and problem solving? How will you be a better leader by being more emotionally controlled?

Here Artificial intelligence is an excellent vehicle or model for better understanding the nature of the human mind. AI permits a level of impartiality – a removal of us as biological, emotional creatures from the equation – to address its '[central problems \(or goals\) includ\(ing\) reasoning, knowledge, planning, learning, communication, perception](#)'. These pursuit of these goals stimulate advanced understanding of skills central to excellence in business. On a standalone basis, the understanding of the area is of critical importance to the future strategies of most businesses.

PRICE FIXING :

Price fixing is one of the important work in business management . Analyse in customer point of view whether the price is worthful for the product and also think as business man how to get profit in fixing price for the product. No customer will ready to buy a cheap product with higher price. Selling best quality products in low price leads to create doubt about that product in customers mind and it will also lead to loss for the organization. A cognitive model using AI will calculate and tell us the price to fix for the product .This will done basis on the data set containing values like Customer's idea , investment , expenses , Market value , Brand value , company targeted profit etc. AI model will calculate the reasonable price to fix for the product . Therefore, AI will help us to fix prices for the products.

PRODUCT'S STATE:

Creating a new product and introducing into a market is a risk process . A person who understands customers mind can able to take this risk . Knowing Customer needs , their perception , their wish can make the products as profitable product in the market . If product has bad market then it will leads to loss.AI model should calculate whether the product has good market or not , whether it has good reach to all peoples.This can be done using a data set containing values like Cutomer's reviews and ratings.Our AI model should calculate each product state and solutions to solve issues.

SAMPLE AI MODEL RESULT IN ANALYSING AMAZON PRODUCT REVIEW DATA:

Result of a sample AI model about finding which product has good market

(For sample code refer apenditure)*

THE PRODUCT ---- Monopoly Junior Board Game GOT MAXIMUM RATING ----5 UNDER THE CATEGORY Toys

THE PRODUCT ---- 56 Pieces of Wooden Train Track Compatible with All Major Train Brands GOT MAXIMUM RATING ----5 UNDER THE CATEGORY Toys

THE PRODUCT ---- Barbie Doll and Fashions Barbie Gift Set GOT MAXIMUM RATING ----5 UNDER THE CATEGORY Toys

THE PRODUCT ---- Melissa & Doug Water Wow Coloring Book - Vehicles GOT MAXIMUM RATING ----5 UNDER THE CATEGORY Toys

THE PRODUCT ---- Fun Express Insect Finger Puppets 12ct Toy GOT MAXIMUM RATING ----5 UNDER THE CATEGORY Toys

THE PRODUCT ---- Fisher-Price Octonauts Shellington's On-The-Go Pod Toy GOT MAXIMUM RATING -- --5 UNDER THE CATEGORY Toys

THE PRODUCT ---- 100 Foot Multicolor Pennant Banner GOT MAXIMUM RATING ----5 UNDER THE CATEGORY Toys

THE PRODUCT ---- Pig Jumbo Foil Balloon GOT MAXIMUM RATING ----5 UNDER THE CATEGORY Toys

THE PRODUCT ---- Minecraft Animal Toy (6-Pack) GOT MAXIMUM RATING ----5 UNDER THE CATEGORY Toys

THE PRODUCT ---- Hot Wheels 48- Car storage Case With Easy Grip Carrying Case GOT MAXIMUM RATING ----5 UNDER THE CATEGORY Toys

THE PRODUCT ---- ZuZo 2.4GHz 4 CH 6 Axis Gyro RC Quadcopter Drone with Camera & LED Lights, 38 x 38 x 7cm GOT MAXIMUM RATING ----5 UNDER THE CATEGORY Toys

THE PRODUCT ---- Teenage Mutant Ninja Turtles T-Machines Tiger Claw in Safari Truck Diecast Vehicle GOT MAXIMUM RATING ----5 UNDER THE CATEGORY Toys

THE PRODUCT ---- Holy Stone F180C Mini RC Quadcopter Drone with Camera 2.4GHz 6-Axis Gyro Bonus Battery and 8 Blades GOT MAXIMUM RATING ----5 UNDER THE CATEGORY Toys

THE PRODUCT ---- Yoga Joes - Green Army Men Toys GOT MAXIMUM RATING ----5 UNDER THE CATEGORY Toys

THE PRODUCT ---- Cards Against Humanity GOT MAXIMUM RATING ----5 UNDER THE CATEGORY Toys

THE PRODUCT ---- Monster High Haunted Student Spirits Porter Geiss Doll GOT MAXIMUM RATING ----5 UNDER THE CATEGORY Toys

THE PRODUCT ---- Star Wars Clone Wars Clone Trooper Child's Deluxe Captain Rex Costume GOT MAXIMUM RATING ----5 UNDER THE CATEGORY Toys

THE PRODUCT ---- LEGO Creative Tower Building Kit XXL 1600 Pieces 10664 GOT MAXIMUM RATING ----5 UNDER THE CATEGORY Toys

THE PRODUCT ---- Intex River Run I Sport Lounge, Inflatable Water Float, 53 in Diameter GOT MAXIMUM RATING ----5 UNDER THE CATEGORY Toys

THE PRODUCT ---- Paraboard - Parallel Charging Board for Lipos with EC5 Connectors GOT MAXIMUM RATING ----5 UNDER THE CATEGORY Toys

THE PRODUCT ---- The Game of Life Money and Asset Board Game, Fame Edition GOT MAXIMUM RATING ----5 UNDER THE CATEGORY Toys

THE PRODUCT ---- LCR Dice Game (Red Chips) GOT MAXIMUM RATING ----5 UNDER THE CATEGORY Toys

THE PRODUCT ---- BCW - Deluxe Currency Slab - Regular Bill - Dollar / Currency Collecting Supplies GOT MAXIMUM RATING ----5 UNDER THE CATEGORY Toys

THE PRODUCT ---- Ocean Life Stamps Birthday Party Supplies Loot Bag Accessories 24 Pieces per Unit GOT MAXIMUM RATING ----5 UNDER THE CATEGORY Toys

THE PRODUCT ---- New Age Scare Halloween Party Pumpkin and Bat Hanging Round Lantern Decoration, Paper, 9" Pack of 3 GOT MAXIMUM RATING ----5 UNDER THE CATEGORY Toys

THE PRODUCT ---- Pokemon - Double Dragon Energy (97/108) - XY Roaring Skies GOT MAXIMUM RATING ----5 UNDER THE CATEGORY Toys

THE PRODUCT ---- Pokemon - Gyarados (31/113) - Legendary Treasures GOT MAXIMUM RATING ----5 UNDER THE CATEGORY Toys

THE PRODUCT ---- LeapFrog LeapTV Letter Factory Adventures Educational, Active Video Game GOT MAXIMUM RATING ----5 UNDER THE CATEGORY Toys

THE PRODUCT ---- Disney Planes: Fire & Rescue Scoop & Spray Firefighter Dusty GOT MAXIMUM RATING ----5 UNDER THE CATEGORY Toys

THE PRODUCT ---- Winston Zeddemore & Ecto-1: Funko POP! Rides x Ghostbusters Vinyl Figure GOT MAXIMUM RATING ----5 UNDER THE CATEGORY Toys

THE PRODUCT ---- Yu-Gi-Oh! - Solemn Judgment (GLD5-EN045) - Gold Series: Haunted Mine - Limited Edition - Ghost/Gold Hybrid Rare GOT MAXIMUM RATING ----5 UNDER THE CATEGORY Toys

THE PRODUCT ---- Seat Pets Car Seat Toy GOT MAXIMUM RATING ----5 UNDER THE CATEGORY Toys

THE PRODUCT ---- Baby Einstein Octoplush GOT MAXIMUM RATING ----5 UNDER THE CATEGORY Toys

34 PRODUCTS GOT MAXIMUM RATING

ADVERTISEMENT:

Best way to reach your product to customer is through advertisement. Advertisement is done through newspapers, Media ads, Digital marketing, Banner etc. Our AI model will calculate which product must have advertisement in an organization, how much money should be spent in advertisement for that product, will that advertisement can be worthwhile to increase that product sales growth. Therefore, AI will help us to analyse about a product.

DECISION MAKING TO INCREASE PROFIT:

Decision-making is one of the basic cognitive processes of human behaviors by which a preferred option or a course of actions is chosen from among a set of alternatives based on certain criteria. The interest in the study of decision-making has been widely shared in Cognitive science because it is a fundamental process of the brain. The most fundamental decision that is recurrently used in any complex decision system and everyday life is a Cartesian product of a set of alternatives and a set of selection criteria. The larger both the sets, the more ideal the decisions generated. Another interesting finding of this work is that, although the cognitive complexities of new decision problems are always extremely high, they become dramatically simpler when a rational or formal solution is figured out. Therefore, the reducing of cognitive complexities of decision problems by heuristic feedbacks of known solutions in each of the categories of decision strategies will be further studied in intelligent decision support systems

Our AI model will taken into account all the above model and analyse the data and calculate the profit. All the problems in the product, customer's reviews and ratings are taken into account for calculating the profit of an organizations. Decision should be made by taking all the observations into accounts.

CONCLUSION:

In today's world the volume of unstructured informations is growing at an enormous rate we really need better technologies to help make sense of it and make better decision. Cognitive computing systems expands the boundaries of human cognition becomes smarter with use and have much more natural interaction in the area of artificial intelligence. Many applications use technologies that go beyond the main working of the app itself and this AI observes Customer's need and enriches company's profit. The problems that we're facing now are too complicated for a single human to figure out all by themselves and so the AI Model which solves the problem is going to be a combination of humans and machines working together to make a kind of integrated intelligence. In this AI model people and computers are connected so they act more intelligently than any person group or computer has ever done before. At the highest level you can imagine this AI model that would understand, see situations and would be able figure out explanations in an events and be inventive with respect

to scenarios overcome the limits of imagination and creativity .AI model will taken into customer's needs , company's production , investment , expences etc. to calculate the company's profit at regular interval.

APENDITURE:

Sample AI Model program to find which product has good market

Sample code:

```
import csv
import time
proid=[]
pro_title=[]
pro_category=[]
rating=[]
with open('sample.csv') as csvfile:
    reader=csv.reader(csvfile)
    for line in reader:
        proid.append(line[3])
        pro_title.append(line[5])
        pro_category.append(line[6])
        rating.append(line[7])
maxi = rating[1]
count = 1
for i in range(1,len(proid),1):
    if(maxi <= rating[i]):
        maxi = rating[i]
        print(" THE PRODUCT ---- "+pro_title[i]+" GOT MAXIMUM RATING ----"+maxi+" UNDER THE
CATEGORY "+pro_category[i])
        count = count+1
print(count," PRODUCTS GOT MAXIMUM RATING")
```