



FRAMEWORK TO BUILD AND ANALYZE DATA SCIENCE WITH ARTIFICIAL INTELLIGENCE

S SARAVANAKUMAR

ASSISTANT PROFESSOR / CSBS

KIT- KALAIGAR KARUNANIDHI INSTITUTE OF TECHNOLOGY, COIMBATORE

saravanakitbe@gmail.com

ABSTRACT

Artificial intelligence (AI) is truly a revolutionary feat of computer science, set to become a core component of all modern software over the coming years and decades. It enables us in acquiring technical skills to perform data processing, analysis and visualization in multiple real-time applications. Artificial intelligence tools and techniques, including problem-solving, knowledge representation, Machine Learning(ML), computer vision, human-computer interactions and information diffusion. This presents a threat but also an opportunity. AI will be deployed to augment both defensive and offensive cyber operations. Additionally, new means of cyber attack will be invented to take advantage of the particular weaknesses of AI technology. Finally, the importance of data will be amplified by AI's appetite for large amounts of training data, redefining how we must think about data protection. Prudent governance at the global level will be essential to ensure that this era-defining technology will bring about broadly shared safety and prosperity.

OBJECTIVES

This chapter main goal is to imitate human intelligence using computers so that machines can make smart decisions in complex situations. To achieve this goal, we need to develop new algorithms, optimize existing neural networks, and perform data automation for processing huge chunks of data. The overall research goal of artificial intelligence is to create technology that allows computers and machines to work intelligently. The general problem of simulating (or creating) intelligence is broken down into sub-problems.

KEYWORDS:**AI(Artificial Intelligence), ML(Machine Learning), Augment, Data****1. INTRODUCTION**

It is evident that over the years, there has been a spectrum of developments in the technology sector. The involvement of artificial intelligence at every step is has turned out to be amazing. It made so many jobs automated, reducing human effort. It has made everyone believe that there is yet more to come in the future.

Artificial intelligence has proved to be a path-breaking experience in every field and not just technology. Online retailers in the fashion industry have readily invested a good sum of money in AI while the others plan to do so in the next 24 months, as stated by recent surveys.

Now the question is why is the e-commerce industry showing their interest in Artificial Intelligence? The following points will help you get a better understanding of this question:

2. RECEIVING PERSONALIZED EXPERIENCE

Amongst the entire benefits of AI, one is that it imparts personalized experience to its customers. It allows online retailers to not only add personalized pages to their websites but also provide personalized recommendations to their visitors. This ensures to raise sales and at the same time make good communication with the visitors. The recommendations do store a record of what the people previously like or what they purchase and other than that it also shows a few more complimentary products that the customers would probably show interest in if not buy. So AI in the retail business is on the right track doing wonders.

3. CHATBOTS HELPING TO BOOST CUSTOMER INTERACTION

73% of customers prefer brands that provide immense customer support; as stated by a survey. Obviously, people prefer a person lending their hand while they are at it which is the traditional way that has been there ever since. But with the invasion of chatbots, the tables have completely turned upside down. A report concludes that by the end of 2020, approx 80% of customer interactions will be managed by Artificial Intelligence. Chatbot or Chat-robot is an AI-controlled computer program that prompts human conversations. The AI Chatbot works as a virtual help desk in assisting the company.

4. HIGH-END SECURITY

AI will ensure customers with their security-related concerns. Many people tend to have second thoughts while adding products to their cart so they discard them due to security reasons. This will no longer happen as the online shopping companies will be making use of high-end security. It will also catch fraudsters by identifying any sort of inconsistency in purchase behavior.

5. OVERCOMING BUSINESS CHALLENGES

AI is helping to overcome challenges faced by the e-commerce industries. Through AI, the previously purchased history, demographics, likes and dislikes and pain areas can be accessed which will be present as a record so that the company is able to recognize its target customers. This is a good way to keep the e-commerce brands engaged with one another in a very productive way.

6. IMPROVEMENT IN SEARCH RESULTS DUE TO MACHINE LEARNING

Customers or no customers, search results are one such parameter that has to be there on every website possible be it anything. Providing a good search result will not only boost customer satisfaction but also create their interests intact. Machine learning generates a search ranking which helps to keeps everything organized by importance instead of key matching which used to be a way back in the day.

7. IMPROVEMENT IN THE SALES PROCESS

In this generation where almost everything has its base set up on the virtual platform, the traditional door to door selling is out of business. But now that the base is shifted to online platforms, there has to be a lot of data generated. Through AI, companies can track the order history, predictive analytics as well as purchase frequency. This helps in figuring out when would the customer order next. This information can be used greatly to bring out sales campaigns and boost sales in number. Machine learning and deep learning are the trending topics worldwide with their applications being brought into effective action not only in business but in all the major segments. Taking both into consideration, there are several courses offered where you could learn both or either of them. Many institutes offer great online as well as regular courses on Machine learning and Deep learning.

8. ARTIFICIAL INTELLIGENCE USE CASES

Applications of AI can be seen in everyday scenarios such as financial services fraud detection, retail purchase predictions, and online customer support interactions. Here are just a few examples:

8.1 Fraud detection.

The financial services industry uses artificial intelligence in two ways. Initial scoring of applications for credit uses AI to understand creditworthiness. More advanced AI engines are employed to monitor and detect fraudulent payment card transactions in real time.

8.2 Virtual customer assistance (VCA).

Call centers use VCA to predict and respond to customer inquiries outside of human interaction. Voice recognition, coupled with simulated human dialog, is the first point of interaction in a customer service inquiry. Higher-level inquiries are redirected to a human. When a person initiates dialog on a webpage via chat (chatbot), the person is often interacting with a computer running specialized AI. If the chatbot can't interpret or address the question, a human intervenes to communicate directly with the person. These non interpretive instances are fed into a machine-learning computation system to improve the AI application for future interactions

9. RESEARCH METHODOLOGIES

9.1 Symbolic Method: Also known as the "top-down" approach, the symbolic method simulates intelligence without considering the biological structure of the human brain. As the name suggests, this method analyzes the thought process of the human brain by processing symbols.

9.2 Connectionist Method: On the other hand, the connectionist approach deals with building neural networks by imitating the biological structure of the human brain. Also known as the "bottom-up" approach, this method mobilizes more fundamental brain cells.

Both these methods compete for the approach to developing AI systems and algorithms. Although they may appear similar, they differ in their principle. Whereas the "top-down" approach focuses on symbolic details, the "bottom-up" approach considers neural activities inside the brain. We can highlight the difference between these two approaches with an example. Consider a robot that recognizes numbers through image processing.

The symbolic approach would be to write an algorithm based on the geometric pattern of each number. The program will compare and match numeric patterns of different numbers stored in its memory. The robot would train its artificial neural network by repeatedly tuning it to recognize numbers in the connectionist approach. In a way, The Connectionist approach more closely emulates the human mind and its thought process than the symbolic approach. We can use both these methods of AI implementation when developing algorithms. While the symbolic approach is famous for simple problems, researchers prefer the connectionist method for complex, real-world problems. Despite showing immense potential, both of these approaches have produced limited results.

In addition to these two major classifications, researchers have coined several approaches to implementing AI.

9.3 Logic-based AI uses formal logic to represent knowledge, planning, and learning in the human mind. Rather than imitating human thought, this approach focuses on determining the basis for logical reasoning and abstract thinking.

9.4 Anti-logic AI: Some researchers argue that it is impossible to capture every aspect of human behavior using simple general logic. Rather than using simple logic, the anti-logic approach deals with ad hoc solutions for machine learning and vision processing.

9.5 Knowledge-Based AI: With important memories computers becoming available around the 1970s, people began to add AI applications. As a result, systems architecture incorporated facts and rules to depict algorithms in their systems.

9.6 Statistical learning: In recent years, researchers worldwide have combined advanced mathematical and statistical models such as information theory, decision theory, etc., to develop AI algorithms.

10. CONCLUSION

AI is at the centre of a new enterprise to build computational models of intelligence. The main assumption is that intelligence (human or otherwise) can be represented in terms of symbol structures and symbolic operations which can be programmed in a digital computer. There is much debate as to whether such an appropriately programmed computer would be a mind, or would merely simulate one, but AI researchers need not wait for the conclusion to that debate, or for the hypothetical computer that could model all of human intelligence. Aspects of intelligent behavior, such as solving problems, making inferences, learning, and understanding language, have already been coded as computer programs, and within very limited domains, such

as identifying diseases of soybean plants, AI programs can outperform human experts. Now the great challenge of AI is to find ways of representing the commonsense knowledge and experience that enable people to carry out everyday activities such as holding a wide-ranging conversation, or finding their way along a busy street. Conventional digital computers may be capable of running such programs, or we may need to develop new machines that can support the complexity of human thought.

11. REFERENCES

- 1) <https://www.globaldigitalfoundation.org/artificial-intelligence-and-machine-an-introduction-for-policy-makers>
- 2) <https://www.shponline.co.uk/technology/artificial-intelligence-discussion>
- 3) Machine Learning for Absolute Beginners , Author by O Theobald, Scatterplot press, 2nd Edition.