

# The interaction of natural and artificial computing within artificial intelligence: data science, applications, and trends.

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**Abstract:** Artificial intelligence is remaking our society (frugality, education, way of life, etc.) and heralding a new era for the social welfare state with all its enabling capabilities, such as machine and deep literacy in computational intelligence- based systems. The interaction between natural and artificial computation serves as the epitome of current developments in data wisdom and artificial intelligence in this study. An overview of recent workshops on the subject is provided, and state-of-the-art is summarized thoroughly and restrained to provide a framework for the global artificial intelligence community. Additionally, this essay aims to provide a thorough analysis and some pertinent discussions of the current trends and points of view within the various theoretical and operational fields covered, from the most advanced operations in robotics, neuroscience, brain-computer interfaces, drugs, and society at large to theoretical models in artificial intelligence and machine literacy.

**Keywords:** - Artificial intelligence (AI), data science.

## 1. INTRODUCTION

Recent decades have seen a rise in the importance of artificial intelligence (AI) due to its numerous real-world applications. The process of imitating human intelligence is known as artificial intelligence. The situation of the world today is a result of human intelligence. Robotics, internet applications, data mining, and industrial applications are a few examples. Another is facial recognition. Data science is an ever-evolving field that is constantly pushing the boundaries of what is possible. As technology advances, so too do the tools and techniques used in data science. In the future, we can expect to see more sophisticated algorithms, more powerful computing resources, and more advanced data analysis techniques. We can also expect to see more applications of data science in areas such as healthcare, finance, and marketing. Overall data science is a powerful tool that is transforming the way we understand and interact with data. As more data becomes available, we can expect to see continued innovation and new applications of data science that will shape our world in ways we can only imagine.

## 2. MODELS

### PROGRESS IN DATA SCIENCE

Data science is a fast-evolving discipline that is transforming the way we deal with information. We can extract valuable insights from enormous datasets using a combination of math's, computer programming, and statistics. Data science is the process of analyzing and interpreting data in order to obtain insights and make recommendations. Data science has transformed how firms work. Business owners may now make better decisions using data-driven insights. Businesses may obtain a competitive advantage by exploiting data to get insights into consumer behavior, industry trends, and the quality of products. Big data has also enabled the creation of new innovations like artificial intelligence (AI) and machine learning (ML). Machine learning and artificial intelligence are implemented to automate procedures and make data-driven judgments. Businesses have gotten more efficient and effective as a result of this. Data science has also facilitated the creation of fresh products and services. Businesses may now develop goods and services which are personalized to their client's demands. Businesses have been able to improve their consumer base and income as a result of this. Data science is additionally being applied to healthcare. Data science is being used to create novel illness treatments and remedies. It is additionally utilized to improve diagnostic accuracy and generate individualized therapies for patients.

### A NEW ERA OF AI

This issue has gained significant attention as a result of the uproar caused by the DL models. As soon as our dataset is strong enough for its functional form to be at least somewhat close to the true one, For instance, there is room for improvement in the accuracy and effectiveness of learning techniques, and it is uncertain if they should be used to smaller datasets because they are yielding such outstanding results. The idea of reinforcement learning, on the opposite hand, makes a perfectly logical suggestion: it is suggested that the concept it's own collects data from its surroundings through optimizing a particular reinforcement purpose (reassurance that also comes from the planet's response to the program's shutdown).

## MODELS IN ONTOLOGY, STATISTICAL DATA, HYBRID, AND BIOLOGICAL SCIENC.

In regard to the issues stated above, ontologies provide a crystal-clear illustration of explicit models. Regarding the previously mentioned problems, ontologies offer a crystal-clear example of explicit representations. The authors review the many methods used to address interoperability and standardization issues in the study of mild cognitive impairment and other neurodegenerative disorders, as well as other disciplines related to those subjects. They discuss a convolution neural network rule-extraction technique that employs a transparent structure hidden under several layers. This technique makes it possible to see the centroid of each rule, giving a visual representation of the network's operation. Using in silicon studies, they also examine the connection between the computational characteristics of ANNs and neural codes and draw two findings.



Fig 1: SAS human-machine cognitive cooperation

### 3. TRENDS AND APPLICATIONS IN DATA SCIENCE

Examples of technologies that have emerged as a result of the development of data science as a field of research and practical application over the past century include machine learning, processing of natural languages, and computer vision. In general, these have made it easier for machine learning to evolve as a means of reaching artificial intelligence, a field of science that is rapidly transforming how we live and perform. Theoretical and practical applications of data science include big data, predictive modeling, and machine intelligence. If data is the oil of the information age and machine learning is the engine, data science is the digital equivalent of the physical rules that drive combustion to occur and pistons to move.

#### Small Data and TinyML

Big Data is the term used to describe the tremendous increase in the digital data we are creating, gathering, and analyzing. However the size of the ML algorithms we employ to evaluate the data is also fairly vast, so it's not only the data that is enormous. With over 175 billion parameters, GPT-3 is the biggest and most sophisticated system capable of mimicking human language.

#### Data-Driven Client Experience

Companies use data to create experiences that are more worthwhile, valuable, or enjoyable, such as reducing friction and bother in online buying, more user-friendly software front-ends, and interfaces, or less time spent on holding and switching among departments when contacting customer service are all examples of data-driven customer experience initiatives. This has also motivated firms to personalize their offerings of goods and services to us. In online retail technology, the epidemic has generated a flood of investment and innovation as companies seek to replace the tactile, hands-on experiences of brick-and-mortar shopping excursions.

#### Deep fakes, generative AI and synthetic data

Generative AI is a technology that seeks to produce or create something that does not actually exist in reality. It has been used in the arts and entertainment sector to produce artificial data that can be used to train other machine learning algorithms, such as facial recognition algorithms. It can also be used to develop language-to-image skills, enabling an architect to generate concept drawings of a building just by explaining how it would seem verbally.

#### Convergence

The digital revolution is driven by artificial intelligence, the internet of things (IoT), cloud computing, and ultrafast networks like 5G. IoT devices can operate intelligently and interact with one another with the least amount of human intervention, while 5G and other ultra-fast networks will make it possible for new types of data transfer to become commonplace. AI algorithms play a key role in this, from traffic routing to automating environmental controls in cloud data centres. Data science work will be done at the nexus of these game-changing technologies to ensure they complement one another and get along. To guarantee that these paradigm-shifting breakthroughs complement one another and operate well together, data science work will be done at the intersection of these innovations.

#### AutoML

"Automated Machine Learning" is a contraction. The "liberalization" of data science that is described at the start of this article is being driven by the interesting trend known as autoML. Developers of autoML solutions aim to create tools and platforms that anybody can use to create ML applications. It is aimed primarily at subject matter specialists who, although uniquely

prepared to provide solutions for the most pressing problems in their specialized domains, usually lack the technical abilities necessary to apply artificial Intelligence to those problems.

#### 4. APPLICATIONS IN DATA SCIENCE.

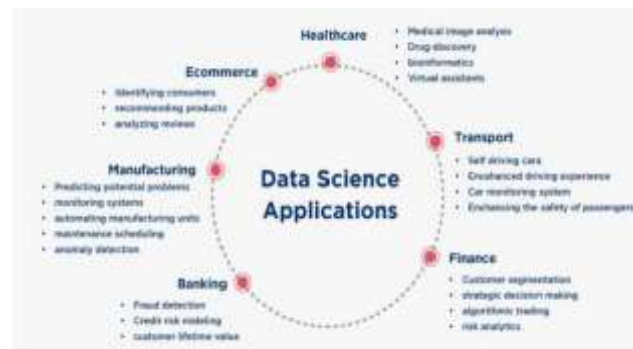


Fig 2: Diagram showing data science applications.

##### SEARCH ENGINE

The one of most effective use of big data is in search engines. We frequently use search engines like Yahoo, Google, Firefox, Safari, and others to find stuff online, as is well known. Hence, data science is used to quicken searches.

##### FINANCE

The financial industries are significantly impacted by data science. In the financial industry, fraud is a constant issue and there is always a chance of loss. For the economic industry to make organizationally strategic decisions, risk of loss analysis must be automated. To anticipate the future, the financial industries also use data science analytics techniques. It can help businesses forecast changes in the stock market and customer lifetime value.

##### E-COMMERCE

E-Commerce Data science is used by sites like Flipkart, Amazon, and others to improve the customer experience through tailored suggestions.

##### HEALTH CARE

Data science is a benefit to the healthcare sector,

- Identifying tumors
- Drug development.
- Analysis of medical images.
- Electronic medical robots.
- Genetics and genome research.
- Diagnostic Predictive Modeling, etc.

##### IMAGE RECOGNITION

Today, image recognition also makes use of data science. For instance, when we submit an image of our friend on Instagram, Instagram suggests tagging other people who are in the image. Data science and machine learning are used to do this. When an image is recognized, data from one's Instagram friends are analyzed, and if the faces in the image correspond to someone else's profile after analysis, Instagram proposes auto-tagging.

##### MEDICAL AND DRUG DEVELOPMENT

Making medication is a highly challenging, drawn-out procedure that requires extreme discipline because someone's life is at stake. Lacking of data science, it would require a great deal of time, money, and assets to create new medications or therapies. Nevertheless, with data science, the prediction of success rates may be quickly estimated based on biological data or characteristics. Without conducting laboratory tests, the Algorithms based on data science will forecast how this will affect the human body.

##### AUTOCOMPLETE

The autocomplete feature, which enables users to finish a line of text by merely typing a few letters or phrases, is a crucial aspect of data science. When composing a formal email to someone, Google Mail's Autocomplete feature is used, which makes that person an effective choice to automatically complete the entire line. The Auto Complete feature is popular across a variety of apps, social media platforms, and search engine.

## 5. CONCLUSION

The interaction between natural and artificial intelligence is an exciting and ever-evolving field. AI has the potential to revolutionize the way we interact with the world, from automating tasks to providing insights into complex problems. It is important to ensure it is used responsibly and ethically, and integrated into our lives in a way that enhances our natural intelligence. With the right approach, AI can be a powerful tool for improving our lives and creating a better future. Data science is an ever-evolving field that is constantly pushing the boundaries of what is possible. As technology advances, so too do the tools and techniques used in data science. In the future, we can expect to see more sophisticated algorithms, more powerful computing resources, and more advanced data analysis techniques. We can also expect to see more applications of data science in areas such as healthcare, finance, and marketing. Overall, data science is a powerful tool that is transforming the way we understand and interact with data. As more data becomes available, we can expect to see continued innovation and new applications of data science that will shape our world in ways we can only imagine.

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