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Byte Quest

Department of CSE

NATURAL LANGUAGE PROCESSING

INTERNET OF BEHAVIOUR (IOB)

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AUTOMOMOUS TRUCKS BY FEDEX

Department Vision

To be a center for academic excellence in the field of Computer Science and Engineering education to enable graduates to be ethical and competent professionals.

Department Mission

To enable students to develop logic and problem solving approach that will help build their careers in the innovative field of computing and provide creative solutions for the benefit of society.

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NATURAL LANGUAGE PROCESSING

Natural language processing, usually shortened as NLP, is a branch of artificial intelligence that deals with the interaction between computers and human beings using the natural language.
Linguistics is the scientific study of language, including its grammar, semantics, and phonetics.
Computational Linguistics is the modern study of linguistics using the tools of computer science. Computational linguistics also became known by the name of natural language process, or NLP, to reflect the more engineer-based or empirical approach of the statistical methods. Statistical NLP has turned another corner and is now strongly focused on the use of deep learning neural networks to both perform inference on specific tasks and for developing robust end-to-end systems. Natural Language Processing takes some applications in the following: Search, Autocorrect and Autocomplete, Language translators, Chatbots, Survey Analysis. To summarize, NLP in combination with deep learning, is all about vectors that represent words, phrases, etc. and to some degree their meanings.

INTERNET OF BEHAVIOUR (IOB)

The Internet of Things (IoT) is defined as a source connecting an electric device to the Internet, and IoB (Internet of Behavior) is the extension of IoT that reveals significant information about our behaviour.

The Internet of Behavior can be considered as a combination of three fields viz. technology, data analytics, and behavioural science. COVID-19 pandemic is partly responsible for making IoB the latest trend, as it has changed how consumers interact with brands because of which companies are working on adjusting how they engage with consumers. The Internet of Behavior combines existing technologies that focus on the individuals directly. This new technology is optimizing the relationship with the consumer based on the collected data. IoB will continue to grow and become the ecosystem that defines human behavior in the digital world.

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BIOINFORMATICS

Bioinformatics is the use of computers for the acquisition, management, and analysis of biological information. It is a multifaceted discipline combining many scientific fields including Computational Biology, Statistics, Mathematics, Molecular Biology and Genetics.

Bioinformatics has become an important part of many areas of biology. In experimental molecular biology, bioinformatics techniques such as image and signal processing allow extraction of useful results from large amounts of raw data. In the field of genetics, it aids in sequencing and annotating genomes and their observed mutations. It plays a role in the text mining of biological literature and the development of biological and gene ontologies to organize and query biological data. It also plays a role in the analysis of gene and protein expression and regulation. Bioinformatics tools aid in comparing, analysing and interpreting genetic and genomic data and more generally in the understanding of evolutionary aspects of molecular biology. At a more integrative level, it helps analyse and catalogue the biological pathways and networks that are an important part of systems biology. In structural biology, it aids in the simulation and modelling of DNA, RNA, proteins as well as biomolecular interactions.

GOALS OF BIOINFORMATICS

The primary goal of bioinformatics is to increase the understanding of biological processes. What sets it apart from other approaches, however, is its focus on developing and applying computationally intensive techniques to achieve this goal.

Examples include:

pattern recognition, data mining, Machine Learning algorithms, and visualisation. Major research efforts in the field include sequence alignment, gene finding, genome assembly, drug design, drug discovery, protein structure alignment, protein structure prediction, prediction of gene expression and protein-protein interactions, genome-wide association studies, the modelling of evolution and cell division/mitosis. Bioinformatics now entails the creation and advancement of databases, algorithms, computational and statistical techniques, and theory to solve formal and practical problems arising from the management and analysis of biological data. Over the past few decades, rapid developments in genomic and other molecular research technologies and developments in information technology have combined to produce a tremendous amount of information related to molecular biology. Bioinformatics is the name given to these mathematical and computing approaches used to glean understanding of biological processes. Common activities in bioinformatics include mapping and analysing DNA and protein sequences, aligning DNA and protein sequences to compare them, and creating and viewing 3-D models of protein structures.

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AUTONOMOUS TRUCKS

FedEx has started to use self-driving trucks to haul goods between Dallas and Houston as part of a pilot program with autonomous vehicle startup Aurora and heavy-duty vehicle manufacturer Paccar.

Paccar trucks that are equipped with Aurora's technology will be used multiple times a week to complete the nearly 500-mile route along Interstate 45, the companies said Wednesday. The trucks will operate autonomously with a backup safety driver.

"This is really about exploring and understanding the kind of changes that would need to be made to the truck," Sterling Anderson, co-founder and CPO of Aurora told TechCrunch, adding that this includes how the self-driving system and the cloud services it provides fits with FedEx's operations.

There is no end date to the pilot, and Anderson expects it to evolve and extend beyond these handful of trucks on the Dallas-to-Houston route as the company gets closer to a driverless capable product.

The pilot, which was launched Wednesday, follows a strategic announcement earlier this year between Aurora and Paccar to develop, test and commercialize autonomous Peterbilt and Kenworth trucks.

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