



# **A Perspective Approach on Artificial Cognitive Computing and its Future Development**

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**ABSTRACT:** Cognitive computing is an emergent exemplar of intelligent computing technologies and methods, which riggings computational intelligence by independent inferences and observations simulating the contrivances of the humanoid. This article presents a survey on the speculative context and key areas of cognitive computing. Theoretical practicalities of cognitive computing are particularized from the traits of cognitive memory and cognitive manufacturing. Cognitive system services are explored on the basis of the approaches to mend human expertise. Applications of cognitive computing are described on the basis of healthcare and education system.

**KEYWORDS:** Cognitive memory; HCI (Human Computer Interaction); Cognitive computing services; Cognitive learning

## **I. INTRODUCTION**

Computing technique is used to solve a given computational problem by commanding instructions. In a broad sense, it is a method to contrivance the instructive intelligence by a system that conveyances a set of quantified data or commands into predictable actions. Cognitive computing is the tendency of Artificial intelligence (AI) and it depends on traditional techniques centred on expert systems and abusing statistics and mathematical models. In precise, cognitive computing is the model of human thought processes in an electronic model. It encompasses self-learning system that use Data Mining, Pattern Recognition and Natural Language Processing (NLP) to impressionist the functioning of human brain. And also presenting distinctive capabilities in uncertainties and problem solving that classically require computation and consuming processes. Furthermore, to learn from the past they manipulating the accumulated experience, equally from faults and effective outcomes.

## **II. RELATED WORK**

In [1] authors developed an Object Functional Role Perspective method to bestow a robot with abundant comportment understanding. While considering object selection and interaction, the role-based technique models the human cognitive method and Markov random field (MRF) model. In [2] authors accompaniments cognitive characteristics of OSM exemplary with societal traits by letting learners to reconnoiter models of viscount learners and/or an accumulated lecture archetypal. In [3] authors offered a technique for the driver cognitive distraction recognition at stop-controlled connections and with speed-limited highway, compares its feature subsets and classification accuracy. In [5] author methodically established an abstract intelligence model, cognitive function model to identify the diverse stages of brain, cognitive thinking and controverter pragmatic interpretations in brain studies. In [6] authors pragmatic cognitive technology in the edification field whether this expertise contributes reimbursements and also make petite evaluation of pertinent capabilities. In [7] author recognized that cognitive computing is to pursue appropriate mathematical revenues for their distinctive needs and a set of cognitive progression of the mind are analytically established towards the investigation of the conjectural charter of cognitive informatics.



# International Journal of Innovative Research in Computer and Communication Engineering

(An ISO 3297: 2007 Certified Organization)

Vol. 4, Issue 11, November 2016

## III. MAJOR AREAS

Cognitive computing plays a substantial role in three main areas, which are human-computer interactions and communication, progression of the internet of things (IoT) and computation capabilities. HCI: Human-computer interactions have need of a brain-like computer to exploit cognitive computation. To distinguish human emotional situations and to enhance personnel assignment in high threat environments, real-time brain cognitive process recognition from EEG could be used. IoT: the prominence of records or documents in modern business creates the inevitability for cognitive computing in the internet of things (IoT). In the future of smart IoT venues, the whole world will exercise data to make decisions using realities rather than constitutions. Related to rule-based decision system, cognitive computing practices data and retorts to fluctuations within it to make restored decisions on the basis of precise learning from older understandings. Companies can instantaneously procure the welfares by assimilate cognitive computing into their prevailing IoT through its bite-sized wedges such as intellectual, planning, predicting and diagnosing information such as text and images. Some APIs enable cognitive capabilities in key areas like NLP (Natural language Processing), Machine Learning, Text analytics, Video and image analytics.

## IV. COGNITIVE MEMORY

The memory of human is exceptionally multifarious. Electrical engineers contrive the memory systems that parade human-like behaviour by discerning the human activities. In 2010, at Stanford University, Widrow and Aragon fashioned the rudimentary form of cognitive memory entailing of software and hardware equally. To solve the problems in the fields of pattern recognition, face recognition and control systems, this cognitive memory can be used. This cognitive memory functions are does not bout with regular computer memory. At the succeeding obtainable memory location, the arriving sensory data would be stowed, and indeed might be stockpiled superfluously at numerous bare locations. The sensory data would neither sited in well-known or quantified memory nor would have keywords. The current set of sensory data or patterns has a prompt signal, which is used to initiate the retrieval. The retrieval system would be used in search that makes practice of auto-associative artificial neural networks. For human facial recognition system, this cognitive memory system has been practically implemented.

## V. COGNITIVE MANUFACTURING

Three ways of cognitive manufacturing are cognitive processes and operations, intelligent assets and equipment and smarter resources optimization. Cognitive processes and operations, which examine an assortment of data from workflows, framework, method, environs to drive quality, enrich manoeuvre and decision-making. Intelligent assets and equipment used related sensors, analytics, and cognitive capabilities to intellect, converse and self-diagnose to elevate presentation and condense superfluous downtime. Smarter resources optimization combines several forms of records from localities, entities, practice and capability with cognitive acumen to make enhanced practice of a syndicate's workforce or use of dynamism.

## VI. COGNITIVE SYSTEM SERVICES

Cognitive computing system can easily interoperate with other applications and bequest systems as well. It is endowed by the opulent set of APIs within a speckled catalogue of building blocks obtainable and allows building unconventional cognitive applications. There are some methods to improve, scale and accelerate human expertise.

### A. **CONCEPT EXPANSION:**

It accomplishes text analysis. Based on context, it can learn phrases, similar terms and words. This tool enables users to swiftly generate a lexis and set of related terms from data sets of text fragments or collections of documents. Then to further understanding of data and to improve text analytics, the output can be used.

### B. **CONCEPT INSIGHTS:**

It gazes for connotations of concepts privileged sets of pamphlets provided by users. Consequently, two types of links are identified by services: explicit link and implicit link. A document directly mentions concepts, in these instance



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explicit link procedures. And if it is not directly connected, in this case to connect input documents to relevant concept implicit links uses

## C. **DIALOG:**

Based on an accepted conversational interface, an interaction mechanism of an application with a user is designed.

## D. **NATURAL LANGUAGE CLASSIFIER:**

It analyse sentences or phrases in a given extent and provide the superlative identical classes by applying cognitive computing techniques.

## E. **RELATIONSHIP EXTRACTION:**

It analyse sentences into their various components and looking for relationship between the components.

## F. **SPEECH-TO-TEXT AND TEXT-TO-SPEECH:**

The anterior renovates the human speech into the transcribed word and the second practices text and natural language to provoke fused audio output.

## G. **TONE ANALYZER:**

To recognize tendencies that people spectacle in their languages, It Influence cognitive linguistic analysis.

## H. **VISUAL RECOGNITION:**

To understand the happenings in scene, it analyse the visual appearance of images or video frames. The semantic classifiers diagnose sundry visual objects such as settings, objects and events, based on machine learning technology.

## VII. COGNITIVE APPLICATIONS

Cognitive computing can be applied in several areas like health care and education system. In healthcare system, it can be applied for an evidence-based medical verdict provision system. The focal precise knack of cognitive system is diagnosing and classifying images, this feature can be actual expedient in cancer pathologies, expressly breast cancer, lung cancer and prostate cancer. Cognitive system able to sustenance the doctor parsimonious of analysing several pamphlets in a petite period. It could analyse in detail every single medicinal record of individual patient by probing for correspondences. In education field, cognitive computing services are integrated into software applications can strappingly enrich student's recitals in computer science courses and also used in digital collaborations with scholars can augment their enactments and affluence in supervision classes and erudition provisions. In proximate future, there will be a prompt expansion of cognitive computing technology and related applications.

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ISSN(Online): 2320-9801  
ISSN (Print): 2320-9798

# International Journal of Innovative Research in Computer and Communication Engineering

*(An ISO 3297: 2007 Certified Organization)*

Vol. 4, Issue 11, November 2016

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