

# Brain Interface as Latest Component in Expert System

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## Abstract

As In the world of Today, everything is dependent upon Artificial Intelligence tools and Decision support making tools. We know an organization grows and take decision with the help of Artificial intelligence tools. AI basically contains User interface, Knowledge Interface and Data Interface. In our research, we will be showcasing that how brain Interface can be used to strengthen Artificial Interface structure. A brain-machine interface is a communication system that does not depend on the brains normal output pathways of peripheral nerves and muscles. It is a new communication link between a functioning human brain and the outside world. In Expert system, only the user was allowed to interact with the system via question answering but Computer was not exactly able to trace what is going inside the human brain. With this latest technology, Rather than establishing the connection between human and computer, a strong connection between Human brain and computer can be developed. The current structure of the expert system can be expanded by adding brain interface module into it. This will increase the efficiency and capability of the expert system in problem solving and decision making. This topic of Brain interface is very useful in Medical departments, scientific areas and decision making in different high level organizations. Secondly Expert systems till now just take the verbal signals from human being or the typed contents whereas if include Human brain interface with Expert system module. It basically transforms fiction into reality. Our research and further study will give a new vision to medical field, military field and various other organizations how brain interface can be collaborated with expert system .Infact a situation can arise when the knowledge can be directly extracted out if the mind and can be used in different application without intervening the length process of extracting and refining the knowledge. Infact various human day to day activities such as driving the car, moving the cursor , typing through the keyboard, al l this can be converted into digital signal and can be feed into

human brain and these activities can be used as input to expert systems and decision making.

## Introduction

This paper focuses and study of how brain interface and Expert system can be collaborated with each other. Infact their collaboration can bring the evolutionary changes and new developments in both the fields. Although developing this model is not a tough job, it just involves the major task of converting the input from the brain interface system into electrical signals and then bypassing that signals as input to expert system. After the signals are transferred from brain to experts system, then the decision and problem solving task will be computed from brain interface inputs. Once both Brain interface and expert system are collaborated with each other, it will create new innovations and discoveries in various Artificial Intelligence such as Natural Language processing, speech Recognition, computer vision, Robotics and Automatic programming. This model will reduce the physical workload on the human beings. For example, TV can be operated without using the remote, Computer screen can be operated without using the mouse, cursor movements can be easily incorporated with brain interface system. Secondly expert systems outputs and decisions are not very accurate because Human can make mistakes in entering the data or sometime may speak lie. In that case Inputs from the brain interface can be forwarded to Expert system module and as the ideas and notions from the human brain are always true, so the accuracy of the output also increase. Hence we can say that collaboration of Brain interface with the human interface is 85% accurate. Brain interface uses brain activity to control, command, actuate and communicate with the world directly through brain integration and peripheral devices and other technological divisions. Here the data can flow from brain to outside world or from outside world to brain. The major benefits are

Individualized, self-adjusted level of instruction immediate feedback portability; consistency and better control of updating and variety of presentations.

Intelligent systems are used to support decision-making and problem-solving applications. Their benefits include:

- Enhanced problem-solving.
- Improved decision quality.
- Ability to solve complex problems.
- Consistent decisions

## 2. Working of BCI with Expert System

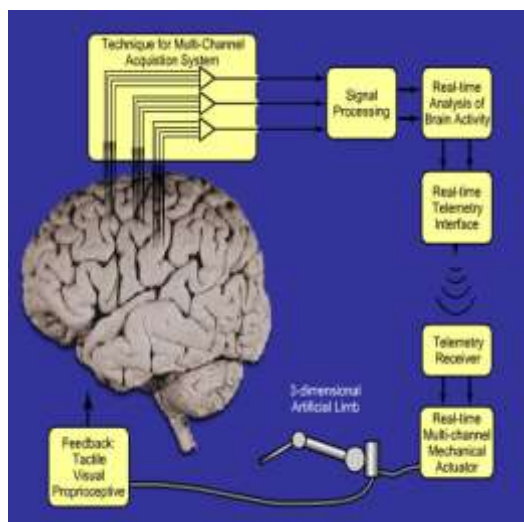
2.1 Initially the signals from the human brain will be accuited and then the signals are converted into electrical signals so that they can be feeded into the systems for further processing.

2.2 This signals are amplified and converted into the digital signals.

2.3 This signals are entered as Input directly from brain to expert system Module rather than taking the verbal communication feedback or through the inputs from the user.

2.4 Once the input is received, the various expert system technologies such as backward chaining, forward chaining, if else rules are applies on the input data. These technologies try various search strategies to fetch the data from the database at the backend.

2.5 The outputs are generated with the integration of Knowledge base and data base.



## 2.1 Working of Expert system Brain Interface

Expert systems, natural language processing, robotics, speech understanding, speech (voice) recognition, computer vision and scene recognition, intelligent computer-aided instruction, neural computing, intelligent agents, automatic programming, translation of languages, and summarizing news can all be considered AI technologies. The major technologies are expert systems, neural networks, intelligent agents, fuzzy logic, and genetic algorithms.

## 3. Expert System Vs Brain Interface System

- Expert system basically takes verbal conversation, typed content as Input whereas Brain Interface system will consider the notions going inside the human brain as Input.
- Secondly, Expert system doesn't contain Signal Converter module whereas Brain Interface System convert all the radiations from the human Brain t into electrical signal.
- Expert system is helpful in problem solving whereas Brain interface system is supportable in both Decision making and Problem solving matters.
- Expert system works upon real surviving and live patterns whereas Brain interface has the capability to work upon Paralysis or person with physical Disability.
- Expert system will be internet based application whereas Brain Interface can be developed as Neural Network as it can work without being connected to internet.
- Expert system is a two way communication channel where user and expert system communicates with each other via dialogues or question answers whereas Brain interface with expert system will be a single way communication channel as whatever coming out of the mind will be considered as Input to the system.

## 4. Application

This technology will be highly successful in recovering various medical problems. Till now, it has been used for paralysed person where they can trace out the movements of wheel chair. Brain control interface will definitely improve the quality of life for people facing the physical disability. People who have lost their senses such as sight or touch can wear artificial sensor which will work upon brain computer interface. It also provides disabled people with communication, environment control and movement restoration. Also, this technology can also be used in creating artificial body parts such as artificial hands, legs and eyes etc. Besides Medical application, Gamers will soon be able to interact with the virtual world using their thoughts and emotions all alone. It is the brain computer interface that reads electrical impulses in the brain and translates them into commands that video game can accept and control the game dynamically.

Secondly the biggest advantage of the Brain Interface is in the crime detection and can be used by crime agencies in detection the truth coming out of the criminal Mind. Rather than criminal speaking lie and believing the words of criminal, Experts can easily read the mind of Criminals.

In fact several strong areas of brain Interface system work for mood swings, treating emotional disorders, vanishing chronic pain. We can directly search by applying brain concepts using neural network.

## 5. Advantages

- Collaboration of Brain interface and Expert system will include the sensible and true input coming directly from the human brain. The lies and unnecessary data can be easily Discarded and this feature will enhance the quality of output generated at the end.
- It will convert the entire fiction and imaginary world into reality.
- .A key advantage of this technology is that sensors don't have to be physically entered into human brain.
- It can make human life simpler in daily day to day activities .A user can operate man y electrical appliance without even physically moving. For examples, Fans and tube lights

can be automatically be switched on/off without pressing the switch. Doors can be automatically opened and closed.

- It can copy and trace the activity and movements of various animals and human being that can be saved and Restored in Robots which will give new additions to ongoing activities in Robotics Field.

## 6. Disadvantages

- The entire setup of brain interface with Expert system is not wireless which then restricts its geographical limitations. This system need wireless setup to be developed immediately.
- It has to only consider the sensible quote and signals out of the human brain and has to discard the unnecessary notions .This task and activity is practically very tough.
- This technology is quite expensive and unaffordable for common people to use it in their medical Treatment.
- Expert system is a two way communication channel where user and expert system communicates with each other via dialogues or question answers whereas Brain interface with expert system will be a single way communication channel as whatever coming out of the mind will be considered as Input to the system.
- Due to Multiple implications and complex structure, this technology is difficult to adapt.
- As this technology is integration og human brain. So sometimes it can create physical problems such as Laziness, head ache and Depression.
- The biggest impediment to BCI technology at present is the lack of a sensor modality that provides safe, accurate and robust access to brain signals. It is conceivable or even likely; however, that such a sensor will be developed within the next twenty years. The use of such a sensor should greatly expand the range of communication functions that can be provided using a BCI.

## 8. Conclusion

At the end, it can be concluded that when expert system module is developed by including brain interface system, it will definitely bring new evolutionary world. In future the Data input mode will not be limited to typing, , speaking etc, now the ongoing input inside the brain will also be considered. Secondly it will give biotechnology a new vision and scope of discovering new artificial body parts. We can say that as detection techniques and experimental designs improve, the brain computer interface will improve as well as will provide the wealth alternatives for individuals to interact with environment .This technology will improve the quality of the outputs generated by expert system and will definitely give a new vision to Artificial Intelligence segment.

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