



## ARTIFICIAL INTELLIGENCE AND ITS APPLICATION TO PSYCHOTHERAPY

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### Abstract :

*Psychology is an ever-growing field of science. An important aspect of Psychology deals with working with clients and patients who require counseling and psychotherapy to deal with their difficulties. The area of psychotherapy is constantly updated with innovations and new researches. One such innovation which has found its application in the field of psychotherapy is Artificial Intelligence. Artificial Intelligence (AI) is a broad phenomenon based on contemporary approaches of machine learning, computer science and human psychology. Artificial Intelligence deals with the contemporary world in a unique sense of its application that lays the procreation of developed processes which integrates information, data analysis etc. used for deciphering complex problems. In the psychological context Artificial Intelligence has proved its competence by accounting certain procedures in the diagnosis, testing and assessments and treatment thereby suggesting a unique technological displays in form of machines, software's, games, virtual and multivirtual reality etc. Artificial Intelligence and computer programming has given rise to various software's which are very efficient. In psychological context these software's promotes mental health treatments and diagnosis of the disorder in a particular individual. AI Mental Health Therapy Software techniques deals with the diagnosis of the symptoms in an individual through verbal output, tone of voice, facial expression and body language. Similar software's are also used in testing and assessment of various psychological variables and disorders and further initiates therapeutic techniques like CBT, mindfulness exercise and many more. This paper is an attempt to understand how different AI techniques can be used in various aspects of Psychotherapy including data collection, testing and assessment, diagnosis and various aspects of treatment for psychological issues.*

**Key words:** *Artificial intelligence, Psychotherapy*

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### **Introduction :**

Psychotherapy is an important aspect of Psychology. The field of psychotherapy is constantly updated with new research and innovations. One such innovation is the application of Artificial Intelligence (AI) to Psychology in



general and Psychotherapy in specific. Artificial Intelligence is a broad phenomenon based on contemporary approaches of machine learning, computer science and human psychology. Artificial intelligence is an attempt to ease the complex tasks with the help of high technology paradigm. The entire focus of AI is to make a human-end support to humans. The origins of AI shows that program design and description has always relied on the elements of human psychology, hence the concept of human mind meets high demands with that of making of any machines, software's which involves AI.

In the golden era of technology, AI has emerged in the field of Psychology and has associated itself with various disciplines of psychology like social, cognitive, clinical, cyber etc. Recent research in the field of AI has seen effective application of Artificial Intelligence in Psychotherapy in working with clients and patients who require counseling and therapy for dealing with various life situations and psychological disorders. AI has given a broad spectrum of ideas in relation with the psychotherapies which is in interest of mental health workers and psychologically ill patients. Ranging from diverse software for data collection, psychological testing and assessment, helping in diagnosis of a disorder, use of computer games, robotics to virtual and multi virtual reality focusing on mental therapy, AI has shown successful application in the field of Psychotherapy. The present paper aims at understanding the application of Artificial Intelligence techniques to different aspects of Psychotherapy.

### **Review of Literature :**

A lot of research has been conducted to understand the application of Artificial Intelligence in Psychotherapy. This research focuses on specific AI techniques used for the purpose of assessment, client support and therapy and its success in reaching to the clients. Mohammad Tahan(2018), in his paper, an overview on Artificial Intelligence applications and psychology in Iran, talks about psychotherapy and its importance as an aid to people having mental health disorders. The conventional psychotherapy involves client-therapist and one-to-one interaction between them, however growing technology in the present world calls for technological intervention with that of psychotherapy for laying development in this field by better observational capacities, creating awareness and making the clients more attentive. This paper focuses on machine intelligence through computer implemented psychotherapeutic tool.

The application of AI technique is further recorded in emerging field of 'Cyberpsychology' and its applications resulting in various self-help sites, computer administered therapy, web-based application(Tahan, M.,2018). Horia, Z. M. (2011) has also explained the role of Artificial Intelligence in Psychology. In the review paper on AI applications in Psychology, Horia has focused on AI application to the cognitive approach in psychology. With the help of technology, scientists have developed various environment simulation, automatic emotion recognition, simulation of social interaction within groups, therapies for phobias, computer aided treatment in psychiatry, electronic inquiries and automatic results generation for easy analysis. The paper further states the successful use of Information technology applications in cognitive behavior therapy which yielded promising results in UK. It states two distinct level of IT used in psychotherapy, which includes computer aid in patient treatment as well as a support to therapists. Various uses of AI include genetic algorithms, neural network, Fuzzy logic, game therapy, adjunctive palmtop computer therapy, screening and assessment. The HCL technologies and expert systems make such computer friendly psychotherapy (Horia, Z. M., 2011).



Virtual Reality is also used as an extensive tool for communication and memory management, it's uses are not only limited to the visual experiences but it further captures the psychology of new memory formation (Csapó A. B., Horvath I., Galambos P., 2018). Virtual Reality is also presently used to provide stimulation-based exposure as a treatment to phobic disorders and as an aid for various other disorders as well. Taylor & Francis (2020), also speaks on the positive result emitted out of the use of virtual and multi virtual reality in its application to psychotherapy. It is a therapeutic medium for eating disorders and it enhances the outcome of acceptance and commitment therapy, play therapy and exposure therapy (Taylor & Francis, 2020).

Artificial Intelligence has also seen its application to Psychotherapy in form of games. Especially for children, games are the best way to keep them captivated, thus increasing the chances of their cooperation to therapies. A game known as “Co-op world” which is known for psychotherapy in children. This game involves an AI based player and a human player. (Alkalay S. et al., 2020).

Artificial Intelligence software is also applied to Psychotherapy for data collection and collection of feedback. Successful treatments are based on the feedback and recovery rate of the respective patients. Reform 1.0 is a software that is used in data collection and collection of the feedbacks which thereby improves and eases the work of mental health workers thereby giving effective and transparent results. Persisting stigma in some part of the world related to mental health creates a barrier for people to communicate about their mental health issues. Mental Health Chatbox is a portal for such people to escape the societal barriers while interacting about their issues via chat and seeking the necessary counseling and treatment through the online platform (Miner, A. S., Shah, N., 2019).

### **Aim and Objective :**

1. To understand the application of Artificial Intelligence in various forms of Psychotherapy.
2. To study various Artificial Intelligence techniques used in different forms of Psychotherapy.

### **Application of Artificial Intelligence to Psychotherapy :**

Psychology is a broad term specifying human behaviors in diverse fields like social, positive, cognitive, developmental, neuropsychology, clinical etc. Human emotions and behaviors are studied profoundly with a genetic and environmental base. This leads to finding answers to various existing issues that humans encounter. Psychology further deals with the treatment aspect which focuses on diagnosis, testing, assessment and therapy. Artificial Intelligence is a deep-rooted technology as it completely intervenes with any stumbling blocks in day-to-day life. It is a near to accurate representation of human behavior through technology which generates authentic results following the complex processes that humans deal with. This review paper is based on the applications and techniques of Artificial Intelligence dealing with psychotherapies.

### **Software's used in AI :**

The technology has given birth to a new field of psychology known as ‘Cyber Psychology’ or Psychology of cyberspace. This has given rise to a number of internet sites which provide self-help, computer administered therapy,



computer-based hypnotherapy, expert system application based on speech therapy, low quality data input for correct diagnosis of dyslexia, voice pathological cues of MEEI, Adjunctive Palm-top computer therapy, mental health practice management software etc.

1. Self-help sites: The information for diagnosis and treatments for any disorder is readily available on many websites, wherein a few mentions of your symptoms lead to tentative diagnosis and it further leads you through treatment based on some mindfulness exercises or in few cases, ask the concerned individual to seek therapy from a professional.
2. Computer administered therapy: This therapy has gained momentum in recent times considering the amount of success it has received. The therapy focuses on giving cognitive behavioural therapy to clients based on their respective symptoms and has turned to be very efficient in solving their issues by focusing on their beliefs and thoughts.
3. Expert System Application: This part of AI deals with various program codes/ procedural model which uses languages like JavaScript, PHP, CSS and HTML. These program codes are rational solution based to categorize the mental health related issues of the patient. The individual using this system will have to enter their symptoms and the programmed site will classify the disorders and modes of treatment. This helps the client to get a primary understanding of their problems.
4. Massachusetts Ear and Eye Infirmary (MEEI) Database: This database is used for voice pathological cues like speech detection and classification.
5. Adjunctive Palmtop computer therapy: Web based adjunctive therapies help in treating various mental disorders as the technology act as a supplement to the already existing psychotherapies.
6. AI Mental Health Practise management software: This software helps patient and caregiver obtain care during very stressful times during their treatment phase. In this software people with various symptoms can be categorised in the group of disorders through the methods like verbal output, tone of voice, facial expression, body language etc.
7. Computer Based Hypnotherapy application: This application classifies symptoms into three parts, psychological issues, techniques recommended and applied methods which helps the patients assess its needs based on the applications results.

### **Virtual Reality and Multi Virtual Reality used in Artificial Intelligence :**

Virtual reality (VR) is a medium of providing effective environment in order to treat specific disorders, like any phobias. VR is a stimulus-based learning wherein the patients are exposed to certain phobic environments and respective treatments are further provided by the therapists. Virtual Reality environments are colossal tools for memory as well as communication management. This AI technology captures the psychology of new memories. There are various kinds of VRs used and one of the low-cost VR is a Head Mounted Display (HMD). The HMD with high internet data transfer capacity has been successful in treating various disorders. The Multi Virtual Reality is another



medium for effective therapy which includes Play therapy, Acceptance and Commitment therapy and Exposure therapy in turn being an effective treatment for mental health patients.

### **Games in Artificial Intelligence :**

A new form of psychotherapy relies on the game aspect in AI. The therapists are the third entity and observe the player who is the patient seeking treatment. The patient is dealing with the opponent while playing the game which is an AI programmed player. The therapists take notes of all the moves, methods, reactions the patient carry out while playing the games. One such famous game especially used by therapists is the ‘Co-op world’. Many patients who are shy and introvert finds it difficult to communicate with their therapists. These AI built games help the therapists to understand the behavior of such non communicating children client, making it easier in giving them psychotherapy.

### **Robotics in Artificial Intelligence :**

Robotic Psychology is contemporary field which brings in robots as therapists in order to give treatment to the patients. Robopsychology deals with clinical psychology, evidence-based therapy and psychological assessment. Robot is an AI system based on computer programming and can display human behavior. There are two types of robots used; Assistive Robots and Interactive Robots. Assistive robots resemble machines. They are used as industrial robots, medical robots, and service robots. Whereas Interactive/social robots resemble animals or imaginary beings. These robots are indulged in instructing, entertaining and providing therapeutic support to the clients. The Robopsychology is used for psychotherapy or physical and cognitive rehabilitation of the clients. Interactive/social robots are used for a therapeutic purpose as they show human-like behaviors or have other social interaction capacities.

### **Conclusion :**

Artificial Intelligence has been a growing field ever since it started intervening with day to day working standards of people. Its application has blown a huge success in helping the man kind with its vivid technological advances and it is an amusing to experience something so close to human behavior. Artificial Intelligence techniques are applied to the field of Psychotherapy, but with certain limitations. The AI techniques used in Psychotherapy are very interesting and if applied effectively, it can change the way psychotherapy is conducted. Many new techniques of AI are now applied for various aspects of Psychotherapy like data collection, data analysis, assessment, diagnosis, counseling, client support and treatment. However, use of the AI techniques in Psychotherapy is limited due to the costly machinery and software which increases the overall cost of the treatment. The awareness about use of AI techniques is limited and replacement of human therapist with machines is a cause of concern. Moreover, the acceptance of machines over humans is limited as people may not be comfortable speaking and dealing with technology. Human support is of great value when it comes to Psychotherapy. The technology is ever increasing and constantly changing; as a result, the future Psychology is thrilled to foresee the development of Artificial Intelligence.

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