

DOI:<http://dx.doi.org/10.18316/rcd.v15i36.10788>

## THE STUDY OF COGNITIVE PSYCHOLOGY IN CONJUNCTION WITH ARTIFICIAL INTELLIGENCE

### *O ESTUDO DA PSICOLOGIA COGNITIVA EM CONJUNTO COM A INTELIGÊNCIA ARTIFICIAL*

---

**KDV Prasad**

Symbiosis International (Deemed University), Pune, Hyderabad  
E-mail: [kdv.prasad@sibmhyd.edu.in](mailto:kdv.prasad@sibmhyd.edu.in)

**Sripathi Kalavakolanu**

Symbiosis International (Deemed University), Pune, India  
E-mail: [k.sripathi@sibmhyd.edu](mailto:k.sripathi@sibmhyd.edu)

---

#### **ABSTRACT**

The major purpose of this research is to provide a thorough review and analysis of the interplay between artificial intelligence (AI) and psychology. I talk about state-of-the-art computer programs that are able to simulate human cognition and behavior (such as Human-Computer Interfaces, models of the mind, and data mining programs). Applications may be broken down into several sub-categories and have many different aspects. While developing artificially intelligent robots has been and continues to be the major goal of AI research and development, the widespread acceptance and usage of AI systems have resulted in a much broader transfer of technology. The article begins with a brief history of cognitive psychology, a discussion of its fundamental ideas and models, and a look at the ways in which the study is connected to artificial intelligence (AI). The second part of this article takes a closer look at the difficulties encountered by the field of human-computer interaction, along with its aims, duties, applications, and underlying psychological theories. Multiple scientific, pragmatic, and technical obstacles (complexity problems, disturbing coefficients, etc.) stand in the way of extending or overcoming these limits. We also demonstrate the potential use of mental modeling in the areas of diagnosis, manipulation, and education support in this work. Predictions may be made with the use of data mining, knowledge discovery, or expert systems (for instance, the prognoses of children with mental problems based on their settings). The article reviews the missing features and offers an overview of the coefficients used in the system. Finally, we discuss the application of expert systems and life simulation (applied mental model) in virtual reality to benefit autistic people and their loved ones.

**Keywords:** Artificial intelligence; Cognitive psychology; Children's mental health; Deep learning; Convolutional neural network.

## **RESUMO**

O objetivo principal desta pesquisa é fornecer uma revisão e análise completa da interação entre a inteligência artificial (IA) e a psicologia. Falo de programas de computador de última geração que são capazes de simular a cognição e o comportamento humano (tais como Interfaces Homem-Computador, modelos da mente, e programas de mineração de dados). As aplicações podem ser divididas em várias subcategorias e têm muitos aspectos diferentes. Embora o desenvolvimento de robôs artificialmente inteligentes tenha sido e continue sendo o principal objetivo da pesquisa e desenvolvimento de IA, a ampla aceitação e uso de sistemas de IA resultou em uma transferência muito mais ampla de tecnologia. O artigo começa com uma breve história da psicologia cognitiva, uma discussão de suas idéias e modelos fundamentais, e um olhar sobre as maneiras pelas quais o estudo está ligado à inteligência artificial (IA). A segunda parte deste artigo analisa mais de perto as dificuldades encontradas pelo campo da interação homem-computador, juntamente com seus objetivos, deveres, aplicações e teorias psicológicas subjacentes. Os múltiplos obstáculos científicos, pragmáticos e técnicos (problemas de complexidade, coeficientes perturbadores, etc.) impedem a extensão ou a superação desses limites. Também demonstramos o uso potencial da modelagem mental nas áreas de diagnóstico, manipulação e apoio educacional neste trabalho. As previsões podem ser feitas com o uso de mineração de dados, descoberta de conhecimento ou sistemas especializados (por exemplo, os prognósticos de crianças com problemas mentais com base em seus ambientes). O artigo revisa as características em falta e oferece uma visão geral dos coeficientes utilizados no sistema. Finalmente, discutimos a aplicação de sistemas especializados e simulação de vida (modelo mental aplicado) em realidade virtual para beneficiar as pessoas autistas e seus entes queridos.

**Palavras-chave:** Inteligência artificial; Psicologia cognitiva; Saúde mental das crianças; Aprendizagem profunda; Rede neural convolutiva.

## Introdução

It is possible that it would be advantageous to shed light The major purpose of this research is to provide a thorough review and analysis of the interplay between artificial intelligence (AI) and psychology. I talk about state-of-the-art computer programs that are able to simulate human cognition and behavior (such as Human-Computer Interfaces, models of the mind, and data mining programs). Applications may be broken down into several sub-categories and have many different aspects. While developing artificially intelligent robots has been and continues to be the major goal of AI research and development, the widespread acceptance and usage of AI systems have resulted in a much broader transfer of technology. The article begins with a brief history of cognitive psychology, a discussion of its fundamental ideas and models, and a look at the ways in which the study is connected to artificial intelligence (AI). The second part of this article takes a closer look at the difficulties encountered by the field of human-computer interaction, along with its aims, duties, applications, and underlying psychological theories. Multiple scientific, pragmatic, and technical obstacles (complexity problems, disturbing coefficients, etc.) stand in the way of extending or overcoming these limits. We also demonstrate the potential use of mental modeling in the areas of diagnosis, manipulation, and education support in this work. Predictions may be made with the use of data mining, knowledge discovery, or expert systems (for instance, the prognoses of children with mental problems based on their settings). The article reviews the missing features and offers an overview of the coefficients used in the system. Finally, we discuss the application of expert systems and life simulation (applied mental model) in virtual reality to benefit autistic people and their loved ones.on the many different theoretical approaches to thinking that are now being used in order to allow for stronger collaboration across the domains of the psychology of thinking and artificial intelligence. In addition, cybernetics and computer science have been beneficial to the former (informational techniques, issue space, heuristics computer simulation, frames, and scripts). Cognitive

psychology has just recently started to develop, with its focus shifting in recent years to more sophisticated mental activities. The core focus of our investigation, mental representation, is now the topic of a significant amount of research within this theoretical framework. (Lieto, 2021) Researchers in AI and psychology may improve their understanding of the inner workings of the brain by collaborating on research projects. This will also hasten the development of AI's theoretical foundations and its practical applications. After a decade of heated debates, academics have now begun an earnest search for a standardized lexicon to describe the interaction between the psychology of thinking and artificial intelligence. One school of thought maintains that thinking is a skill that is uniquely suited to humans, whereas another school of thought conforms to the principle of cybernetic reductionism. This response was prompted by the need to construct complex systems that require cooperation between human and technical components. This reaction came about during a time when there were intense arguments between proponents of the concept that thinking is a capability that is uniquely suited to humans. To a considerable extent, this may be attributed, from a psychological point of view to the emergence of cognitive psychology. (Smith)

## **Review of literature**

Aktan et al. (2022) examined AI-based psychotherapy preferences. The cross-sectional survey included 872 highly educated 18-year-olds. Participants' preferences for AI-based psychotherapy were examined using the Attitude towards AI-based Psychotherapy, Attitude towards Seeking Professional Psychological Help Scale-Short Form, and Stigma Scale for Receiving Psychological Help Scale. 55% of the sample favoured AI-based psychotherapy. However, most participants trusted human psychotherapists more than AI-based systems for personal data security. However, three key benefits of AI-based psychotherapy were being able to talk about uncomfortable situations, having 24/7 access, and remote contact. Importantly, preferences for AI-based psychotherapy were linked to the assumption that AI-based psychotherapy systems can learn from previous therapeutic experiences. AI-based psychotherapy was also linked to gender and

psychology/technical/engineering professions. The results show that increasing understanding of psychotherapy's benefits and effectiveness and trust in AI technologies can increase preferences for AI-based psychotherapy.

Through the perspective of a fair-by-design approach to algorithm creation and the introduction of a new machine learning-based strategy to job matching, Delecraz et al. (2022) address the general issue of the responsible use of artificial intelligence in human resources management. The algorithmic solution's objective was to enhance and automate the hiring of temporary workers by finding the best match with open job postings. The study also explored how promoting fairness should be a top priority in human resource management and outlined the major issues and gaps in the literature that need to be addressed when creating algorithmic systems that match job candidates with job offers. The authors explained the approach used to assess the efficacy and fairness of our machine learning model as well as strategies to remove specific biases after thoroughly examining the distribution and biases of our exclusive data set.

Most artificial intelligence research is based on brain cognition, but it cannot reproduce human emotional and mental state changes. Due to the limitations of current artificial intelligence, this publication explains that cognitive psychology and AI systems should be studied together. It wants to speed up artificial intelligence and give computers human cognitive abilities, so they can understand emotions and conversation and feel empathy with humans and other AI. Zhao et al. (2022) discuss AI's capacity to understand, possess, and distinguish human mental states. It uses three instances of human-computer interaction—face attraction, affective computing, and music emotion—to demonstrate its utility. These examples support advanced AI research.

Rakover (2022) explains how advanced artificial intelligence (AI) models are attempting to comprehend behaviour. These models' depth and complexity make it challenging to comprehend how they function, making it challenging to utilise them to comprehend behavioural events. The current state of cognitive psychology, which is based on the comparison of human behaviour to computer operations, has this drawback: if we are unable to comprehend the most successful and sophisticated programmes for behaviour prediction, progressive AI models, then perhaps this

should be taken as a sign that cognitive psychology is reaching the limits of its explanatory power.

In their study, Zhang et al. (2021) suggested the Deep Learning aided Integrated Prediction Model (DLIPM) to predict and diagnose childhood mental illness early. Convolutional neural networks (CNN), the model they recommend, are initially built to learn deeply learnt patient behavioural data characteristics. A successful classification and forecast can be made by integrating semantic mathematical approaches of behaviour or brain dynamics into a statistical deep learning framework. The simulation analysis demonstrated that the suggested model considerably improved the results' accuracy.

According to Chance et al. (2020), neuroscience principles have traditionally had a significant impact on artificial intelligence (AI). Additionally, major AI developments from more recent times frequently seem to be more in line with cognitive neuroscience or psychology, concentrating on function at a somewhat abstract level. Meanwhile, neuroscience is ready to enter a new era of large-scale, high-resolution data and seems to be increasingly interested in the underlying neuronal mechanisms or architectures, which can occasionally seem fairly remote from functional descriptions. The authors talked about the cultural disparities between the two disciplines, as well as the different priorities that should be taken into account while using contemporary neuroscience for AI. The study focused on subtle but important cultural changes that would considerably aid in fostering greater overlap between the two sectors.

Miller (2018) reports a renaissance in explainable artificial intelligence as researchers and practitioners aim to make their algorithms more transparent. Much of this study is focused on directly explaining decisions or behaviours to a human observer, and it should not be contentious to claim that looking at how humans explain to each other can help explain artificial intelligence. However, most explainable artificial intelligence research relies on researchers' intuitions of "good" explanations. Philosophy, psychology, and cognitive science have done extensive research on how people define, develop, select, evaluate, and present explanations, arguing that cognitive biases and social expectations influence the explanation process. The paper claims that explainable artificial intelligence can build on this

research and covers important philosophy, cognitive psychology/science, and social psychology works on these themes. The study demonstrates how explainable artificial intelligence can incorporate key results.

According to Murphy (2018), experts disagree on whether the development of artificial super intelligence, which significantly outperforms human cognition in most domains, would have beneficial or bad effects. A third alternative, according to Murphy, is conceivable but frequently disregarded: an artificial superintelligence might decide to have little or no impact on the current state of affairs for a variety of reasons (the already existing collective superintelligence of commercial cyberspace). In the context of discussions about the future of artificial intelligence, Murphy extended and supported this claim by drawing on sporadic findings from web science, philosophy, and cognitive psychology.

The cognitive substrate theory says that a few well-integrated data structures and algorithms can support full human-level cognition. Cassimatis (2006) provided evidence for this claim from the fields of linguistics, cognitive psychology, and neuroscience supported. Several computational concepts solve substrate integration concerns. A Polyscheme natural language syntactic parser that uses only an infant physical reasoning model shows how a single cognitive substrate can underlie intelligent systems in seemingly unrelated disciplines. This research suggests that finding and employing a cognitive foundation will accelerate human-level artificial intelligence.

## **Objective**

The research aimed to fulfill the following objectives:

- The Study of Artificial Intelligence and Psychology
- Interaction Between Humans and Computers
- There are still obstacles to overcome in the study.
- Discovering and coping with Autism with the Use of Expert Systems

## **Methodology**

Mental illnesses such as depression are becoming an increasingly prevalent source of concern and have a significant influence on the individual's overall physical health. Artificial intelligence (AI) tools have been developed in recent years to aid mental health professionals, most notably psychiatrists and clinicians, using decision-making procedures that are influenced by patients' past medical records (e.g., clinical history, behavioural data, social media use, etc.). It is of the utmost importance that underlying issues with children's mental health be addressed, since these issues, if they are not addressed at an early stage, might potentially lead to more challenging issues later in life. As a consequence of this, the Deep Learning Assisted Integrated Prediction Model (DLIPM) has been proposed as a method to early predict or diagnose mental illness in children as a result of this study. Convolutional neural networks (CNN) are initially constructed within the framework of the suggested model in order to get an in-depth understanding of the many patient behavioural data components. Incorporating semantic mathematical techniques of behaviour or brain dynamic dynamics together into statistical deep learning framework may provide insights into disruption, effective classification, and forecasting. These insights can be derived by analysing the dynamics of the brain. According to the findings of the simulation study, the proposed model possesses a higher sensitivity rate of 97.9%, a specificity rate of 96.7%, a recall ratio of 95.6%, a precision ratio of 90.1% of F-measure rate of 95.6%, and a lower error rate of 9.2% in comparison to other methods that are currently being utilised.

## **The study of artificial intelligence and psychology**

One of the pillars around which artificial intelligence is built is psychology, and AI extensively pulls from this field (AI). During the course of his scientific work, Wilhelm Wundt (1832-1920), who was interested in mental processes and engaged in empirical techniques, is acknowledged as being the founder of the science of psychology. The primary goal of the scientific community is to develop a model of human thought (the subfield of artificial intelligence known as human computing



focuses on this question), but another question has emerged: how can we use techniques from artificial intelligence to solve psychological or other problems that are related to humans? If we have access to a complete description of the brain, we will be able to simulate it on a computer. This will provide us with a number of benefits, including a deeper comprehension of natural language processing, increased awareness of emotional intelligence, and improved vision. If we have access to a complete description of the brain, we will be able to simulate it on a computer. (Pennachin & Goertzel)

Both behaviorism and cognitivism were historically recognized as two of the most influential schools of thought within the discipline of psychology. Behaviorism is characterized by its inability to accept the notion of mental processes and its stress on understanding the action or stimulus that was created as objectively as possible. The term "behavior" comes from the French word for behavior, which means "behaviorism." The number of individuals who hold this position has, over the course of the last many years, steadily decreased. According to the principles of cognitive psychology, the human brain operates as a sophisticated information-processing machine. In addition, the use of artificial intelligence provides more support for this idea, and the first picture provides a visual representation of the aforementioned facts. The representation may be changed by the application of cognitive processes, and this manipulation can produce new representations inside the existing representation. The completion of the procedure could lead to the performance of an action. According to Craik, a scientist who worked with knowledge-based agents and who tragically lost away in an unfortunate circumstance, the organism includes a potential little model of the outside world and the probable actions that it may take. On the basis of a model of the brain that processes situations, it is also able to try a variety of different options, choose the best one, react even before the expected future occurs, or analyze the consequences of both the present and the past and respond in the most capable and secure way possible.

## **Interaction between humans and computers**

The everyday usage of computers, user interfaces, and expert programs that may use cognitive psychology to control or assist humans means that we may come into touch with HCI on a daily basis. The goals of this study are to present activities with which psychology has some bearing.

### **Multiple-Modal Human-Computer Interaction**

The field of multimodal human-computer interaction mastered the techniques necessary to make computers easier to understand for human beings. You'll need to grasp these three major points.

#### **User, System, and the Link Between Both (Smith, 1985)**

Understanding the user's objectives, intentions, problem-solving skills (through psychology), interactions (via sociology), physical capabilities (through ergonomics), interface design (via graphical design), and system development are all crucial in HCI (computer science).

#### **Virtual reality (VR) also has applications in HCI.**

Virtual reality (VR) is a novel method of human-machine interaction that makes use of the human senses to facilitate communication. While stereo display technologies provide the user the sensation of interacting with a true spatial representation, other methods allow for direct interaction that seems more natural and intuitive. Contemporary tomography technology (computed tomography [CT] and magnetic resonance imaging [MRI]) (which depicts the human anatomy in great detail) is an intriguing example. The virtual space offers 3D data sets.

The ability to detect and interpret hand movements is a crucial part of the interface.

More and more individuals are connecting to virtual environments, making them an integral element of VR. Human characteristics are useful in these artificial settings (like video games). For a virtual person to exist, several factors may need to be satisfied. thoughts, sentiments, beliefs, character traits, recollections, and societal mores (all of which create an emotional investment in the game for the player) Sensors are linked to a person's behavior, intellect, and motivation so that they can

respond to the environment. An abstract representation of the human mind. The hope of virtual reality is founded on the technologies of artificial intelligence.

Status, information and interaction norms, power dynamics, and nonverbal cues all fall under the umbrella of "social norms."

Different but crucial methods: Audiovisual speed recognition systems are a new focus of HCI researchers, and engineers are hard at work on the challenge of training HCI systems to respond appropriately to users' emotional states. (Goertzel & Pennachin)

#### THERE ARE STILL OBSTACLES TO OVERCOME IN THE STUDY.

The arts; persons with disabilities; mobile phones; the virtual world; Supportive environments for education in both public and private settings. Many people struggle to read, comprehend, and retain the data shown on the screen. Cognitive theories provide a solution to the issue where a regular user can't make sense of the data shown on the screen. Several characteristics, such as emotional states, make comprehension more challenging, and HCI seldom addresses the overarching purpose of the task.

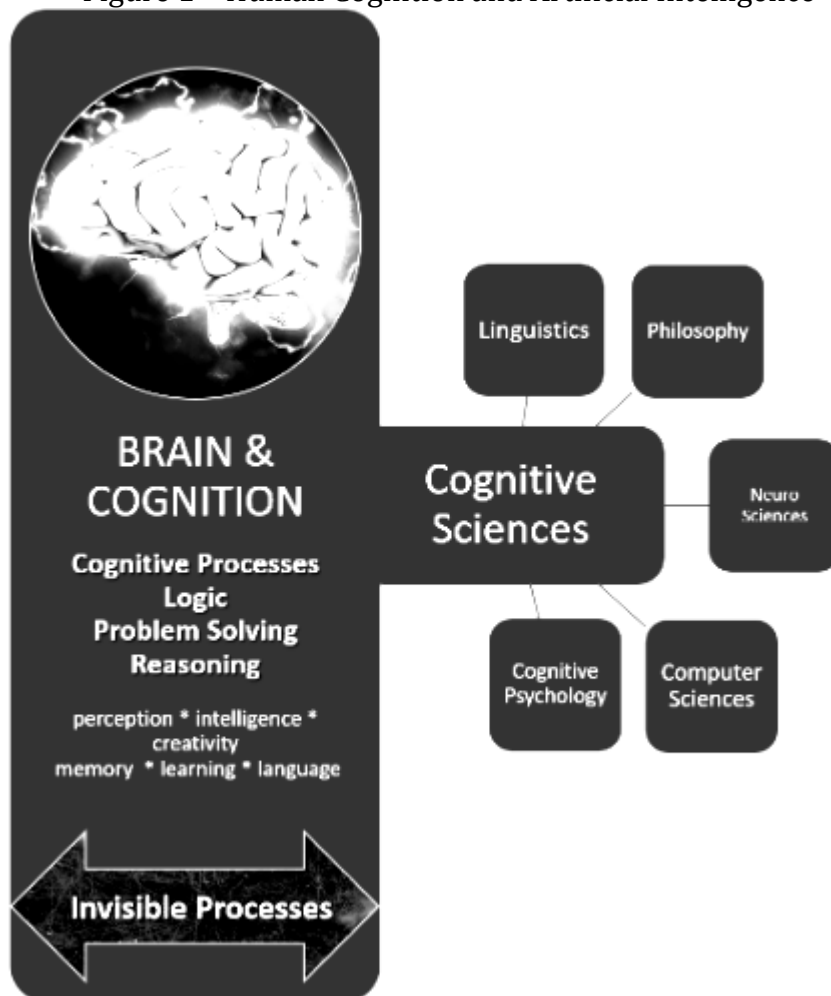
In the past, HCI meant handing over responsibility for operating devices like a mouse and keyboard to the user. However, we cannot simply exclude mental operations from HCI design. (Thagard, 2007)

In a matter of milliseconds, something is changing. Possible behavioral signals that are being lost include:

- Emotional and behavioral emotions (such as fear, and pleasure), manipulation (of self and surroundings), symbols (which vary from culture to culture), and illustration (finger)
- Regulators (like a smile, look)
- It is necessary to do the following steps in order to interpret these signals:
- Analyses and comprehension of the behavior's indicators, such as body language and nonverbal cues.
- Acquiring an awareness of one's surrounding surroundings (with behavior)

- The third criteria are a result of the previous two; namely, an appreciation for human behavior.
- The majority of methods rely on the Gauss Model, a model of probability learning, however, there are other methods as well.
- Model-Based Reasoning (Geometrical forms represent the fingers or the head)
- Physically based (colors, textures)
- Extraordinary point-based (Notices dramatic shifts in location or duration, or picks up on physical or kinesthetic cues)
- The technology interprets the user's movements in space and time.

Figure 1 – Human Cognition and Artificial Intelligence



## **Problems and prospects of cooperation**

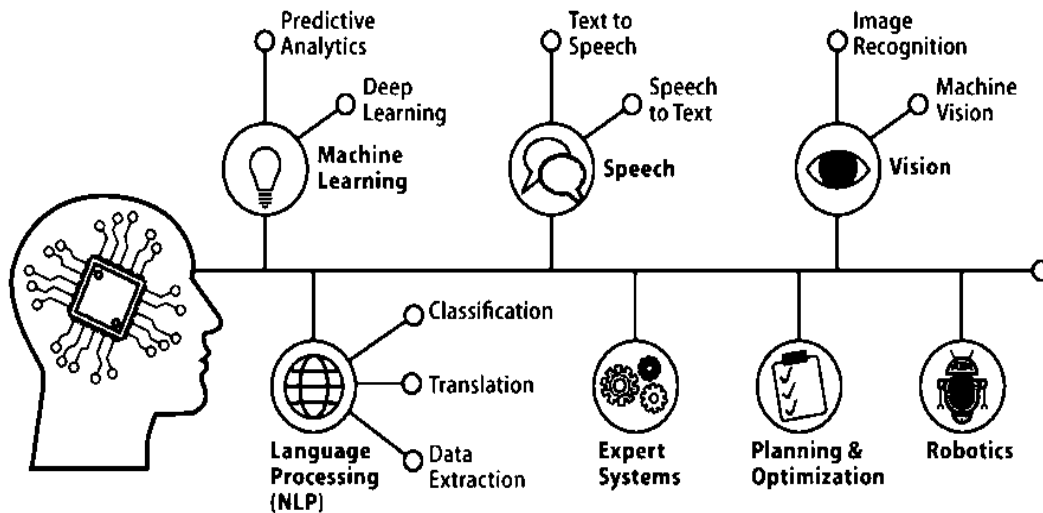
Recently, at the intersection of the fields of psychology and artificial intelligence, the notion of modelling cognitive activity has been evolving. This interface is now center stage for this growth. Computational modelling is utilized as a research tool in psychology, and it helps researchers come up with theories about the building blocks of intelligent behavior.

It is crucial to discover whether cybernetic phrases have able to represent the distinctiveness of psychological occurrences and to clarify the language (artificial intelligence plus psychology sometimes use terms with a separate real meaning) in order to promote cooperation. Thus, for instance, the "value" of information to humans is ignored by information theory. Regarding solved issues, GPS can only mimic a small portion of the mental process (it leaves out all emotional-motivational processes). In human heuristics, distinguishing features are the setting of well-defined goals and the fluid reconfiguration of resources to achieve those goals. Therefore, it's probable that human mind cannot be simplified to processing of information, and a heuristic programmed no longer represents a theory of thinking. (Red'ko)

Soviet cybernetic scientists tend to minimize the significance of studying human psychology when stressing the urgent need to go beyond the constraints of a purely technical knowledge of artificial intelligence. Incorporating essential inner qualities of the human brain into computer work will aid in improving the creation of the product. These characteristics include needs, emotional control of search, goal setting, and a curated image of the scenario. Automata that faithfully replicate the inner workings of the human mind will have an architecture that permits the creation and alteration of multiple representations of actual objects. However, concepts from systems theory and cybernetics should be included into the creation of a complete theory of thought (hierarchical arrangement of components, mental regulating mechanisms). One possible defining feature of an internal representation is the use of the theory of frames, fuzzy sets, and the principles of representation from IA. In general, combining the fields of psychology and AI might lead to significant advances in both the theory and practice of artificial intelligence, as well

as the identification of specific processes of cognition (and especially mental activity). (Lieto, 2021)

Figure 2 – Working of Artificial Intelligence  
**Artificial Intelligence**



### Discovering and coping with Autism with the Use of Expert Systems

Autism is another kind of mental illness that may be identified in young children. If the diagnosis is performed in a timely manner, it may lead to appropriate treatment or assistance. The primary objective of this research project is to create technology aids that will assist autistic persons in being recognized at an earlier stage and in initiating early intervention for the purpose of autism management. (Method originally developed in India) The agent model, to which neural net and positive Reinforcement agents are coupled, is the vehicle through which the AI Gaming Systems provide the youngster with instructive and beneficial instruction. Assessment comprises the computers providing a context-free environment in which many individuals with autism feel comfortable, and therapists and educators are increasingly employing virtual reality technologies to teach basic skills, such as how to cross the street safely. This online platform is used by teacher therapists in order to facilitate the growth of children's skills, including social interaction, cognitive processes, language, and attention. (KAYSER, 1991)

The following are the primary characteristics of the program:

- 68 G. Daróczy
- Capable of adapting to regional lingua francas and regional issues
- Developing social and communication obstacles
- Rehabilitation at home
- Cost-effectiveness
- Artificial Intelligence-based
- Resource setting
- Including emotional treatment.

## **Conclusion**

The physical health of those suffering from mental illnesses like depression is becoming a major focus of attention. In recent years, artificial intelligence (AI) methods have been created to aid mental health professionals, especially psychiatrists and clinicians, in making decisions based on patients' past records (e.g., clinical history, behavioral data, social media use, etc.). Children's basic mental health problems may escalate into serious problems if they are not addressed and treated early on. The essay provided a synopsis, albeit a condensed and in-depth one, of the ways in which cognitive psychology may be used in applications involving artificial intelligence. The list of applications for both research areas is not exhaustive because this is a dynamic and ever-evolving area of study, and the combination of these two fields of study (cognitive psychology and artificial intelligence) will result in the development of remarkable research topics as a result of the combination of these two fields of study. In addition, mental modeling and human-computer interaction are becoming increasingly significant subfields of research within the field of cognitive psychology. The ideas of emotion recognition and cognitive robotics were not covered in this investigation; despite the fact that both of these are major aspects of the subject matter that was covered here.

## REFERÊNCIAS

Cassimatis, N. L. (2006). A Cognitive Substrate for Achieving Human-Level Intelligence. *AI Magazine*, 27(2), 45–56.

Chance, F. S., Aimone, J. B., Musuvathy, S. S., Smith, M. R., Vineyard, C. M., & Wang, F. (2020). Crossing the Cleft: Communication Challenges Between Neuroscience and Artificial Intelligence. *Frontiers in Computational Neuroscience*, 14, 1–9. <https://doi.org/10.3389/fncom.2020.00039>

Delecraz, S., Eltarr, L., Becuwe, M., Bouxin, H., Boutin, N., & Oullier, O. (2022). Responsible Artificial Intelligence in Human Resources Technology: An innovative inclusive and fair by design matching algorithm for job recruitment purposes. *Journal of Responsible Technology*, 11, 100041.

Foundations of Classical Artificial Intelligence and Cognitive Science. (2012). Understanding Intelligence. <https://doi.org/10.7551/mitpress/6979.003.0004>

Goertzel, B., & Pennachin, C. (n.d.). The Novamente Artificial Intelligence Engine. *Artificial General Intelligence*, 63–129. [https://doi.org/10.1007/978-3-540-68677-4\\_3](https://doi.org/10.1007/978-3-540-68677-4_3)

KAYSER, D. A. N. I. E. L. (2013). Artificial Intelligence and cognitive science. *Applied Artificial Intelligence*, 5(2), 153–162. <https://doi.org/10.1080/08839519108927922>

Lieto, A. (2021). Cognitive science and artificial intelligence. *Cognitive Design for Artificial Minds*, 1–19. <https://doi.org/10.4324/9781315460536-1>

Miller, T. (2019). Explanation in artificial intelligence: Insights from the social sciences. *Artificial intelligence*, 267, 1–38.

Murphy, J. (2018). Artificial Intelligence, Rationality, and the World Wide Web. *IEEE Intelligent Systems*, 33(1), 98–103. <https://doi.org/10.1109/MIS.2018.012001557>

Pennachin, C., & Goertzel, B. (n.d.). Contemporary approaches to Artificial General Intelligence. *Artificial General Intelligence*, 1–30. [https://doi.org/10.1007/978-3-540-68677-4\\_1](https://doi.org/10.1007/978-3-540-68677-4_1)

Rakover, S. S. (2022). How Can Behavior Be Understood if Its Explanation is Not Comprehended? Does Cognitive Psychology Reach Its Explanatory Limit? *Journal of Mind & Behavior*, 43(3), 255–268.

Red'ko, V. G. (n.d.). The natural way to Artificial Intelligence. *Artificial General Intelligence*, 327–351. [https://doi.org/10.1007/978-3-540-68677-4\\_10](https://doi.org/10.1007/978-3-540-68677-4_10)



Smith, E. E. (1985). Cognitive psychology. *Artificial Intelligence*, 25(3), 247–253. [https://doi.org/10.1016/0004-3702\(85\)90073-6](https://doi.org/10.1016/0004-3702(85)90073-6)

Thagard, P. (2007). Theory and experiment in Cognitive Science. *Artificial Intelligence*, 171(18), 1104–1106. <https://doi.org/10.1016/j.artint.2007.10.006>

Voss, P. (n.d.). Essentials of general intelligence: The direct path to artificial general intelligence. *Artificial General Intelligence*, 131–157. [https://doi.org/10.1007/978-3-540-68677-4\\_4](https://doi.org/10.1007/978-3-540-68677-4_4)

Zhang, X., Wang, R., Sharma, A., & Deverajan, G. G. (2021). Artificial intelligence in cognitive psychology—Influence of literature based on artificial intelligence on children's mental disorders. *Aggression and Violent Behavior*, 101590.

Zhao J, Wu M, Zhou L, Wang X and Jia J (2022) Cognitive psychology-based artificial intelligence review. *Front. Neurosci.* 16:1024316. doi: 10.3389/fnins.2022.1024316