

## Understanding to Future of Artificial Psychology System: A Survey

Margaret Mary T<sup>1</sup>, Soumya<sup>2</sup>, Ramnathan G<sup>3</sup> and Clinton G<sup>4</sup>

<sup>1,2,3</sup>Computer Science Department, Bangalore University North, KristuJayanti College (Autonomous), India

<sup>4</sup>Computer Science Department, Sambhram Institute of Technology, India

### ABSTRACT

The purpose of this paper is to introduce a very uncommon topic that is rising to strike the symbolization of human thinking on the level of actual thinking. 'Artificial Psychology' the integrity of the future, the field clutches a variety of other artificial intelligence systems and also human psychology. Besides being important advancement in the field of AI, Artificial Psychology also outrivals in the human-computer-interaction, health care, e-learning, automotive, security, and many more. In this paper, a core survey of the papers and articles are put out, in order to identify and understand the first footstep onto the implementation of an existing Artificial Psychology System that overcomes the hurdles and gains the critical understandings of the human brain and also processes accordingly.

**KEY WORDS:** ARTIFICIAL INTELLIGENCE, PSYCHOLOGY, ARTIFICIAL PSYCHOLOGY.

### INTRODUCTION

Constructing an artificial intelligence machine that can ruminates, acquires, and intends, insights, and works unconventionally, without supervision, is one of the most fascinating objectives in all of the technological era. To succeed these design and implementation of structure is simply pale, but also to understand the core system how they must relate, conjoin, and combine to form a complete system. On controversy to cognize the system intelligence into our "artificial brain" (B. Goertzel, et al 2010), we must understand the core function within the human brain. When the thought of equipping man-made machines, to be as a tool of psychological research, to mimic the human-kind thinking, the principles, and criteria for illustrating intelligence are stricter. As the field of Artificial Intelligence (AI) is maturing first, emotions, recognitions, conscience, interrelating, and indulgent, and cognitive are becoming the more core components of modern (AI) (Ray Amit. 2018 and Yookesh, T.L., et al 2020). However, implanting profound levels of Artificial

Psychology (AP) in robots needs a more comprehensive framework. We simply believe that we can build an AI that has emotional understanding and consciousness; that is, overall Artificial Psychology.

**Artificial Intelligence and Artificial Psychology:** Artificial intelligence (AI) in the field of science apprehensive with the learning and strategy of constructing intelligent machines. For individuals new to AI, the possibility of intelligent machines may from the outset invoke pictures of captivating human-like workstations or robots, for example, that portrayed sci-fi (D. D. Luxton, 2016 and Ranjeeth et al 2020). The field was originated by computer scientist "John McCarty, who, along with Marvin Minsky, Nathan Rochester, and Claude Shannon, organized The Dartmouth Conference in 1956" (J. McCarthy, 2006). Over the most, in the past 60 years, AI has progressed into a multidisciplinary field relating to computer science, engineering, psychology, philosophy, and ethics. The very motive from the start of the AI was to build inventive machines with intellectual ability that is indistinguishable and surpass that of human beings (B. J. Copeland and D. Proudfoot, 2007).

"Late physicist Stephen Hawking discussed AI potentially bringing about the end of humanity, stressing the importance of enacting safety measures including raising awareness and a deepened understanding of the risks, challenges, and short- and long-term impacts of AI development" (Stephen Hawking: 2021). The challenge

Biosc Biotech Res Comm P-ISSN: 0974-6455 E-ISSN: 2321-4007



#### Identifiers and Pagination

Year: 2021 Vol: 14 No (6) Special Issue

Pages: 320-323

This is an open access article under Creative

Commons License Attribution 4.0 Intl (CC-BY).

DOI: <http://dx.doi.org/10.21786/bbrc/14.6.66>

#### Article Information

Received: 25<sup>th</sup> April 2021

Accepted after revision: 04<sup>th</sup> June 2021

to create a convincing artificial intelligent system of Psychology that holds a particular fascination for humans knits an intact to the human brain. The AI was meticulously linked with human psychology as a part of compassionate AI and artificial robotics psychology and the modern initialization into health care, community robots, service robots, artificial emotional intelligence. Algorithms and architectures are essential for Artificial Psychology and the key area of research; in general, this is intertwined with the information-processing (L. Pessoa, 2017). As we know, the brain is the fundamental informative processing for the construction of a model and the first picture to illustrate the information processing (S. Hudson, 2020).

**Literature Survey:** “J. E. Laird, C. Lebiere, and P. S. Rosenbloom, “A standard model of the mind: Toward a common computational framework across artificial intelligence, cognitive science, neuroscience, and robotics,” *AI Mag.*,” Here in this paper, the author has proposed such an architectural model just matching the humanlike structure. The preceding proposed system model was incompetent in significant ways, which spring up the root from Allen Newell (1982). Relatively the re-proposed model needed the consensus over the omission, rather than lack of existence or importance. Dawn of 2013 in AAAI Fall Symposium on Integrated Cognition article grew out, brought out in the light with the two of the researcher. To begin with, the authors compared an obligation of background within the article starting with the root and to the complete end. It mentions that the model is skeptical as to whether symbols are misinterpreted labels, such as Lisp, Soar, and ACT-R (J. R. Anderson 1997).

The standard models hold numerically two main informative characters, the first is to denote explicitly quantitative task information, and the other is to annotate the quantitative metadata; that is, data about the data. It also embodies a certain form of statistical learning, which includes Bayesian and reinforcement learning, furthermore retaining a serial bottle-neck with significant amounts of parallelism both within the modules. Cognitive-Architecture the base across the original theme of the paper (R. O'Reilly, et al 2021), where they introduce the three particular architectures extending the standard model, and that are ACT-R, Soar, and Sigma (D. Koller and N. Friedman 2013). Each of this architecture is well explained at their strong terms, along with a figure of their own that standardize the classification of its structure and their behavior around the cognitive cycle. The hope at the end of the paper is to engage and implement the enhanced standard model architecture of the mind.

**“J. A. Crowder and S. Friess, “Artificial psychology: The psychology of AI,” 3rd Int. Multi-Conference Complexity, Informatics Cybern. IMCIC 2012”** (J. A. Crowder and S. Friess 2012). In this paper, they have established some opening principles, theories, and concepts that are the backbone of self-sufficient artificial intelligence. The author has brought forth into light the concept of

‘Artificial Psychology (AP) (M. Imani, 2021), Cognition, Intuition, and Human vs. Machine Emotion, Basic Emotion, Human Perception of AI and AI’s Acceptance. Very insight of the paper is the explanation of psychology stating that it is the mental process and behavior of individual under the topic of Artificial Psychology (J. A. Crowder and J. N. Carbone, 2018 and J. Crowder, et al 2016). He brings out that the AP is a part of the “Artificial Intelligence System” (AIS) (J. Crowder, et al 2010). The AP is a theoretical discipline that was proposed by Dan Custis in 1963; where significant 3 conditions are put down to fulfill the criteria that have been laid on.

Followed by Artificial Cognition mentioning the usefulness and what it takes to be cognitive for the machines to learn, adapt, and maintain their mental process. Artificial intuition makes the point that AIS consider a core service to the cognitive perception requires to deal with the world, autonomous fashion according to Monica Anderson. Israeli has high-tech firm ‘Artificial Intuition’ software that can scan documents at large numbers, in terms of finding terror counter-attacks, makes a note on the significant prominence in the behalf of AP. The emotion of humans is still about thinking. Comparing emotion at arousal states such as the period of calmness and the time of terror, the seeing through the emotions and reactions of the human brain (J. E. LeDoux, 2000). However, for machine intelligence, the entity of emotions is still in the state of being. As closing towards the final section of the article, the author states the human perception and acceptance of Artificial Intelligence, with its merits and demerits, and neutrally concluding the Artificial Psychology.

“J. A. Crowder and J. N. Carbone, “Abductive Artificial Intelligence Learning Models.” Accessed: Jun. 04, 2021. [Online]. Available: [https://link.springer.com/chapter/10.1007/978-3-030-17081-3\\_](https://link.springer.com/chapter/10.1007/978-3-030-17081-3_)” (J. A. Crowder and J. N. Carbone 2021). The following chapter brings out a rudimentary foundation for knowledgeable structures that connect to real-time autonomous, abductive learning in AI systems. Abductive learning defines as deriving a set of hypotheses forgiven an example or observations (H. L.- IJCAI 2021). The possibility and abductive neural networks (PANNS) for decision support in autonomous systems at the steak nature help in the hypothesis of the model. A hypotheses framework for the adductive learning that constitutes an explanation for the set of observations and that is ranked by their possibility ranking by fuzzy sense. To provide a highly-fidelity weighted inference mechanism the model uses a Knowledge Relativity Thread (KRT) (J. A. Crowder and J. Carbone, 2021).

The contextual knowledge storage is threaded relatively with the recombinant knowledge of abductive learning. As moving forward an innovative representation for learned knowledge, the author showcases Newton’s Law of Gravitational, which was described by Polyn and Kahana 2021. The abstracted Newton’s Law of Gravitational as an equivalence that signifies a relationship between two objects of knowledge using context. The following last

part elaborates on the artificial induction hypothesis evaluation logic with the combination of prior concepts. Within an autonomous AI system, they customize the hypothesis to be converging or diverging that's called losing focus, and yet this approach is considered that does not depend on logical or logical, lest on the overall hypothesis.

## CONCLUSION

The concrete presentation in the field of AI technologies and techniques in behavioral and cognitive is rapidly increasing around elementary human sociology. A smart machine can be believed to tackle numerous challenges that are being faced throughout the world. Researchers from various fields have united and have converged in one to create machines that can learn and recognize emotions into an Artificial Psychology System. The above surveys and still many in numbers have bought out the models, architectures, and researches to create an artificial human-like brain to work accordingly to the psychological needed. But to bring out these critical models in the system requires high concentrated AI algorithms and early progression is mandatory. Development of a compassionate artificial psychological system that identifies feel pain, harmony, soothing, and other humanoid characters, the system might need the more and more mature principle of mind all through the process of critical learning.

## REFERENCES

- Anderson, J.R., Matessa, M. and Lebiere, C., 1997. ACT-R: A theory of higher level cognition and its relation to visual attention. *Human-Computer Interaction*, 12(4), pp.439-462.
- Carbone, J., 2010. A framework for enhancing transdisciplinary research knowledge. Texas Tech University.
- Copeland, B.J. and Proudfoot, D., 2007. Artificial intelligence: History, foundations, and philosophical issues. In *Philosophy of Psychology and Cognitive Science* (pp. 429-482). North-Holland.
- Crowder, J.A., Carbone, J. and Friess, S., 2020. Artificial neural diagnostics and prognostics: Self-soothing in cognitive systems. In *Artificial psychology* (pp. 87-98). Springer, Cham.
- Crowder, J.A. and Carbone, J.N., 2016. An agent-based design for distributed artificial intelligence. In *Proceedings on the International Conference on Artificial Intelligence (ICAI)* (p. 81). The Steering Committee of The World Congress in Computer Science, Computer Engineering and Applied Computing (WorldComp).
- Crowder, J.A., Carbone, J. and Friess, S., 2020. Abductive artificial intelligence learning models. In *Artificial Psychology* (pp. 51-63). Springer, Cham.
- Crowder, J.A. and Carbone, J., 2011. Recombinant knowledge relativity threads for contextual knowledge storage. In *Proceedings on the International Conference on Artificial Intelligence (ICAI)* (p. 1). The Steering Committee of The World Congress in Computer Science, Computer Engineering and Applied Computing (WorldComp).
- Goertzel, B., Lian, R., Arel, I., De Garis, H. and Chen, S., 2010. A world survey of artificial brain projects, Part II: Biologically inspired cognitive architectures. *Neurocomputing*, 74(1-3), pp.30-49.
- Hawking, S., 'Transcendence looks at the implications of artificial intelligence-but are we taking AI seriously enough?'. Independent online article 2014.
- Hudson, S., 2020. Artificial intelligence, Cognitive Robotics and Human Psychology. DO-10.13140/RG.2.2.20153.52323.
- J Crowder, J. and Friess, S., 2012. Artificial psychology: The psychology of AI. In *Proceedings of the 3rd Annual International Multi-Conference on Informatics and Cybernetics*. Orlando, FL.
- J Crowder, J. and Friess, S., 2010. Artificial Neural Emotions and Emotional Memory. In *Ic-Ai* (pp. 373-378).
- Johanssen, J. and Wang, X., 2021. Artificial Intuition in Tech Journalism on AI: Imagining the Human Subject. *Human-Machine Communication*, 2.
- Koller, D. and Friedman, N., 2009. Probabilistic graphical models: principles and techniques. MIT press.
- Laird, J.E., Lebiere, C. and Rosenbloom, P.S., 2017. A standard model of the mind: Toward a common computational framework across artificial intelligence, cognitive science, neuroscience, and robotics. *AI Magazine*, 38(4), pp.13-26.
- Laird, J.E., 2019. The Soar cognitive architecture. MIT press.
- LeDoux, J.E., 2000. Emotion circuits in the brain. *Annual review of neuroscience*, 23(1), pp.155-184.
- Levesque, H.J., 1989, August. A Knowledge-Level Account of Abduction. In *IJCAI* (pp. 1061-1067).
- Luxton, D.D., 2016. An introduction to artificial intelligence in behavioral and mental health care. In *Artificial intelligence in behavioral and mental health care* (pp. 1-26). Academic Press.
- McCarthy, J., Minsky, M.L., Rochester, N. and Shannon, C.E., 2006. A proposal for the dartmouth summer research project on artificial intelligence, august 31, 1955. *AI magazine*, 27(4), pp.12-12.
- Moghadama, A.Q. and Imani, M., Towards social intelligent machines by the help of cognitive psychology.
- Newell, A., 1982. The knowledge level. *Artificial intelligence*, 18(1), pp.87-127.
- O'Reilly, R.C., Hazy, T.E. and Herd, S.A., 2016. The leabra

cognitive architecture: How to play 20 principles with nature. *The Oxford handbook of cognitive science*, 91, pp.91-116.

Pessoa, L., 2017. Do intelligent robots need emotion?. *Trends in cognitive sciences*, 21(11), pp.817-819.

Polyn, S.M. and Kahana, M.J., 2008. Memory search and the neural representation of context. *Trends in cognitive sciences*, 12(1), pp.24-30.

Ranjeeth, S. and Latchoumi, T.P., 2020. Predicting Kids Malnutrition Using Multilayer Perceptron with Stochastic Gradient Descent. *Rev. d'Intelligence Artif.*,

34(5), pp.631-636.

Ray, A., 2018. *Compassionate Artificial Intelligence: Frameworks and Algorithms*. Compassionate AI Lab (An Imprint of Inner Light Publishers).

Winston, P.H. and Horn, B.K., 1986. *Lisp*.

Yookesh, T.L., Boobalan, E.D. and Latchoumi, T.P., 2020, March. Variational Iteration Method to Deal with Time Delay Differential Equations under Uncertainty Conditions. In *2020 International Conference on Emerging Smart Computing and Informatics (ESCI)* (pp. 252-256). IEEE.