iJRASET
International Journal For Research in Applied Science and Engineering Technology

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 9 **Issue:** III **Month of publication:** March 2021

DOI: https://doi.org/10.22214/ijraset.2021.33222

www.ijraset.com

Call: 08813907089 | E-mail ID: ijraset@gmail.com

International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.429
Volume 9 Issue III Mar 2021- Available at www.ijraset.com

A Study of Visualisation of the World Based on Sensory Perception

Dr. Madhurima Samaddar
PhD in biotechnology, Former Lecturer, Dept of biotechnology St. Agnes College Mangalore
Former Assistant Professor Dept. of biotechnology, Vijaya College Bangalore

Abstract: It is very difficult to say that we know the real world. We know the world according to our sensory perception. Human knows the world less than animal because animal sensory organs are much stronger than human. But the constant effort of human being by the use of scientific technology to reinvent the world beyond their sensory limitation is helping us to know the world beyond our range and perhaps future research will help us to know a new world.

I. INTRODUCTION

Human being have an amazing capability of conversion of real-world information into electrical information. This conversion is because of our senses. The converted information is processed in our brain and we do different actions depending on the interpretation of the processed information. We have five different senses such as sight, hearing, taste, touch and smelling that help us to react to different stimulus around us. The reaction to the stimulus occurs in two stages one is transduction or stimulation (at the level of sensory receptors) and perception or interpretation (in the brain). The information of the exteroceptors i.e., receptors of the external environment go to the brain via sensory receptor of the nervous system. Even the information of the interoceptors i.e., receptors of bodies internal environment go to the brain (either with or without involving a conscious response) via sensory receptors. The human body is commonly said to have five major exteroceptors: (1) eyes for seeing, (2) ears for hearing (audition) plus balance or motion, (3) nose for smelling (olfaction), (4) tongue for tasting (gustation), and (5) cutaneous exteroceptors in the skin for the sense of touch or taction (also for pain, pressure, and heat). In addition to that there are more interceptors such as proprioceptors (tension receptors) in muscles, tendons and joint capsules, or chemoreceptors for detecting blood pH, CO2, and glucose concentrations, or receptors for heart rate, blood pressure, and other body conditions necessary for homeostasis. But although we have many sensory receptors we are still far away from the real world. It is because of our sensory limitations. Every species has their own sensory perception and it is according to their perception they know the world

II. COMPARATIVE ANALYTICAL STUDY BETWEEN HUMAN AND ANIMALS

It is very interesting to know that the range of our senses are very mush restricted as compared to other animals in the world. The perception by animals is much stronger than human. Even they have some amazing sensory perception that are entirely missing in human. For example, marine animals like shark have an electroreceptor organ known as “ampullae of Lorenzini,” which helps them to detect the variation in physical properties of water like temperature, salinity, water pressure etc.

Fishes and amphibians have a line of sensors along their body by which a slight water-displacement movement by other nearby swimming fishes can be detected (Fields, 2007).The earth’s magnetic field can be detected by some migratory birds and can use them for navigation (Bohannon, 2007).It is not possible for human eyes to see infrared of wavelengths between ~1000 nm and 1 mm) and ultraviolet (UV; roughly 100-400 nm) (Ryer 1997).But animals sensory receptors are much more stronger and both IR and UV spectra are within the range that animals can see. The IR receptors are present in a special pit on the head of the snakes by which they hide and protect themselves unless the pray stray goes out of the range. Even the birds, butterflies and bees are able to see UV spectra. Not only vision the hearing sense organs are also much stronger in animals than human. Human can hear only within the range of 2000–4000 Hz but animals can hear beyond that range.

III. EFFORTS TO OVERCOME THE LIMITATIONS

It is a fact that although humans have sensory limitations, they constantly try to overcome it by the use of scientific technologies. For example, the use of microscope, x ray and ultraviolet scans allow us to see and detect objects that are beyond our range. When scientists observe an object or phenomenon, they would like to employ as many of their senses as possible to produce the best description of these subjects. Sometimes the only sense that can be used is optical; for example, viewing stars, either with or without the aid of telescopes, spectrometers, or other instruments (National Research Council, 1996, p. 145). Astronomers have used radio telescopes and x-ray or gamma-ray detectors to “see” aspects of the cosmos that formerly were hidden from perception.

©IJRASET: All Rights are Reserved

The purpose of the review is to compare the sensory perception between animals and humans and to see the sensory worlds inhabited by other animals, and also realize that these may be very different from the world we perceive. Animal sensory ecology allows us to peer into the perceptual world that animals inhabit, which gives us a better understanding of animal behaviour. It can also give us new ways of "looking" at the world, especially when we can record and analyse stimuli that are in the ultra or infra regions, such as the canine ability to detect odours, which is at least 1,000,000 times more sensitive than a human's (Olender et al. 2004), or stimuli that are utterly impossible for humans to detect because we lack the sensory organs to do so, such as the ability to detect electric fields (Camperi et al. 2007, Heiligenberg 1991), or magnetic fields (Akesson & Backman 1999, Holland et al. 2010, Weindler et al. 1995).We always try to develop devices for those stimuli which we cannot perceive..

IV. CONCLUSION

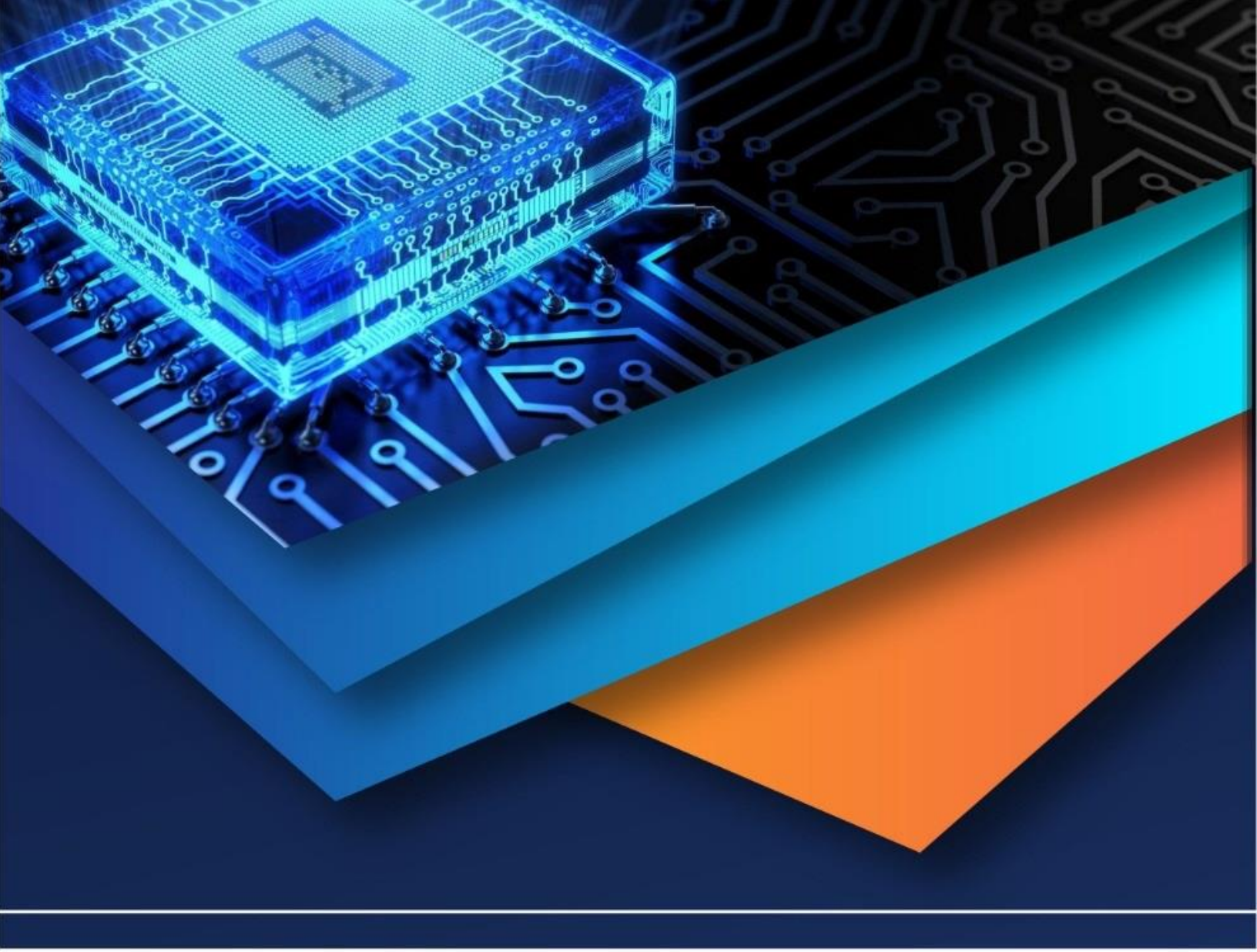
It can be concluded that animal sensory organs are very much developed than human and the review shows that we cannot sense the world as it is but it depends on the strength of our sensory organ to interpret it. It is quite obvious that animals can interpret the various stimuli of the world better than us. Every species tries to develop the senses that is required for communication and for surviving in the environment. But human always tries to improve their limitations by developing sophisticated artificial sensors to detect chemical molecules, light particles, sound waves and electromagnetic energy beyond our own biological sensory. The biological ability to respond to the environment is superior in animals and human are doing it with the help of machines

Animals differ widely from human in their sensory perception. For example, mammals, in general, have a stronger sense of smell than humans. Some animal species lack one or more human sensory system analogues, some have sensory systems that are not found in humans, while others process and interpret the same sensory information in very different ways. For example, some animals are able to detect electrical (Kalmijn, A.J. (1988)) and magnetic fields, (Walker et.al 2002) air moisture (Enjin A et.al 2016), or polarized light, (Cronin, T.W. (2010),) while others sense and perceive through alternative systems, such as echolocation. (Kyhn, L. A et.al 2010). More research is required to be carried out to measure the sensory functions in both animals and humans that will help us to know our world

REFERENCES

[1] Akesson, S. & Backman, J. (1999) Orientation in pied flycatchers: The relative importance of magnetic and visual information at dusk. Animal Behaviour 57, 819–828
[2] Bohannon, J. (2007). Seeking nature's inner compass. Science, 318, 904–907
[3] Camperi, M., Tricas, T. C., & Brown, B. R. (2007) From morphology to neural information: The electric sense of the skate. PLoS Computational Biology 3, e113.
[4] Cronin, T.W. (2010), "Polarized-Light Vision in Land and Aquatic Animals", Encyclopedia of the Eye, Elsevier, pp. 461–468,
[5] Enjin A, Zaharieva EE, Frank DD, Mansourian S, Suh GS, Gallio M, Stensmyr MC (May 2016). "Humidity Sensing in Drosophila". Current Biology. 26 (10): 1352–8.
[6] Fields, R.D. (2007). The shark's electric sense. Scientific American, 297, 74–81.
[7] Heiligenberg, W. F (1991) Neural Nets in Electric Fish. Cambridge, MA: MIT Press,
[8] Holland, R. A., Borissov, I., & Siemers, B. M (2010). A nocturnal mammal, the greater mouse-eared bat, calibrates a magnetic compass by the sun. Proceedings of the National Academy of Sciences of the United States of America 107, 6941–6945.
[9] Kalmijn, A.J. (1988). "Detection of Weak Electric Fields". In Atema, Jelle; Fay, Richard R.; Popper, Arthur N.; Tavolga, William N. (eds.). Sensory Biology of Aquatic Animals. International Conference on the Sensory Biology of Aquatic Animals. Springer Nature Switzerland AG.
[10] Kyhn, L. A.; Jensen, F. H.; Beedholm, K.; Tougaard, J.; Hansen, M.; Madsen, P. T. (2010-05-14). "Echolocation in sympatric Peale's dolphins (Lagenorhynchus australis) and Commerson's dolphins (Cephalorhynchus commersonii) producing narrow-band high-frequency clicks". Journal of Experimental Biology. 213 (11): 1940–1949
[11] Olender T. et al (2004). The canine olfactory sub genome. Genomics 83, 361–372.
[12] Ryer, A. D. 1997 The Light Measurement Handbook. Newburyport, MA: International Light, Inc., 1997.
[13] Weindler, P. B. et al. (1995) Development of migratory orientation in pied flycatchers in different magnetic inclinations. Animal Behaviour 49, 227–234.
[14] Walker, Michael M.; Dennis, Todd E.; Kirschvink, Joseph L. (December 2002). "The magnetic sense and its use in long-distance navigation by animals". Current Opinion in Neurobiology. 12 (6): 735–744

©IJRASET: All Rights are Reserved



10.22214/IJRASET

45.98

IMPACT FACTOR: 7.129

IMPACT FACTOR: 7.429

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Call : 08813907089 (24*7 Support on Whatsapp)