

A New Approach to Biological Mimic Using Artificial Intelligence

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Abstract: The quest towards the understanding of intelligence has different pathways and is used in different fields to solve different problems. This paper presents a newer approach towards the architecture with observation and study of behavioural of a simple biological being and mimics its intelligence using artificial intelligence.

Keywords: Artificial, biological, intelligence, mimic, quest.

I. INTRODUCTION

The understanding of human intelligence is a kind of very difficult task as going through different aspects of our daily life one can actually implement modules which can project certain simple actions of human intelligence in terms of machine intelligence. Complex codes are needed to implement certain aspects of human intelligence but in general biological systems does not run with software instead it actually adopts to its surroundings through certain instincts which are a little bit difficult to implement in code since the implementation could take years of study on biological system and years of coding to convert in to actions and memories. Apart from a simple code and action as per system code there are other aspects that one can actually visualize. Even though there are different definitions for intelligence the most general description is that the ability to perceive information and adapt to environment by analysing the parameters in different ways.

So different algorithm in AI have been developed for optimization, optical character recognition, games and etc, but so far there are no consensus on how closely the brain should be simulated. A theory of hierarchical learning mechanisms may be able to provide a conceptual bridge between biological and artificial intelligence. There are very different ways to understand the intelligence but the basic way is by keen observation which even comes through biological mimic and may be sometimes intelligence may not at all related to brain which actually pulls the view towards plants or may be adoptability is not always related to intelligence itself. Intelligence in human beings not only depends on observation but also on different kinds of aspects like origin, Parents, sex, living conditions and etc. It is very difficult to predict accurately.

II. HISTORICAL PERSPECTIVE TOWARDS ANTS

Since ancient times ants have been acclaimed for their wisdom. Ants stand out at or near the peak of invertebrate development, displaying memory, learning and the ability to correct mistakes and adapt to the environment. Like human societies, ant communities have their own expertise at the three primary methods of obtaining food: gathering,

hunting and growing. System divides the workload among workers, soldiers and the queen. They all live together in the same colony. This system is believed to have existed for 30 or 40 million years. Despite their intelligence, ants are trapped inside rigid and programmed behaviour patterns that are distinct to each species. Ants are found worldwide with exception of Antarctica.

A. Living Habitat

Ants adapt to different atmospheric conditions. There are over 12,000 species of ants around the world. Ants can lift 20 times their body weight. Some of the queen ants can live many years and can eventually give birth to millions of babies. Ants don't have ears but can respond to vibrations in ground through their feet. They don't have lungs but they can breathe through pores on their body. Different ants live in different habitat conditions some prefer dry while others prefer wet. Some of the ants prefer trees to stay upon trees like orange, mango etc, while some prefer earth, wood and even stay inside walls.

III. ANT INTELLIGENCE USING ARDUINO

Arduino is an open source electronics platform based on easy to use hardware and software. It's intended for anyone making interactive projects.

A. Arduino board

Arduino senses the environment by receiving inputs from many sensors and affects its surroundings by controlling lights, motors and other actuators.

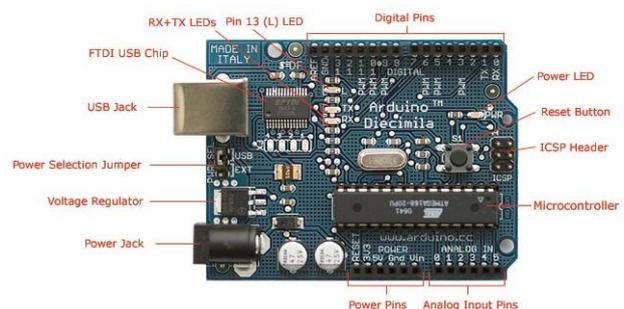


Fig. 1 Arduino embedded board with microcontroller

B. Ant Intelligence

Ant intelligence generally involves its activities to survive and to adapt to situations around it. Simple biological mimic of ant could be helpful in different ways which depends on how actually it is analysed. The proposed ant intelligence system could be helpful in mimic and understand natural system based on simple observations and basic rules they adapt to.

C. Pheromon communication

Ants track their path by using chemical released by them which helps them to stay in path [2] as well as a kind of threat sense. Since the path of ant motion is random but they follow straight line once food is on its way to their home. They have extremely high sensitive cent pickups and perhaps preference based movement is adopted [1] to fetch food.

D. Simple Architecture Approach

Sensor bank and SDM pickup are multiplexed through a real time clock which plays a prominent in the architecture as shown in Fig. 2.

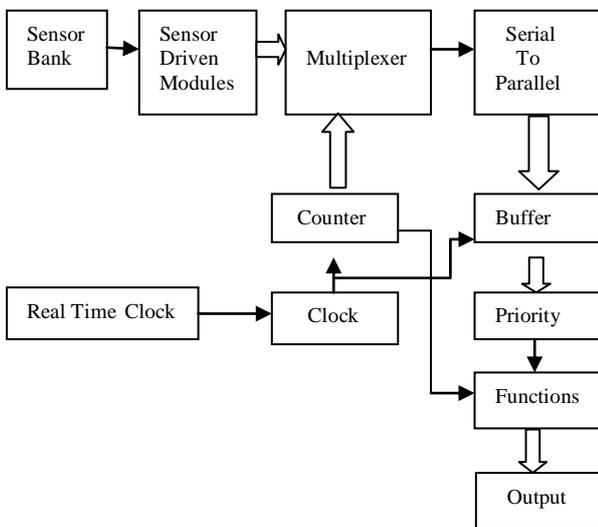


Fig. 2 A simple intelligent architecture

IV. CONCLUSION

The newer way towards the understanding of ant intelligence could be helpful in the design perspective as well as reducing the programming complexity involved in intelligence.

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BIOGRAPHY



Mr. Harsha Mario Akano has completed his B.Tech from Malineni Lakshmaiah Engineering College at Singarayakonda in ECE branch in 2008. He has completed his M.Tech from Aditya Engineering College at Peddapuram in VLSID as specialization in 2014. He worked in various Engineering colleges as Assistant Professor during his services and attended various seminars and his research interests are VLSI, Biomedical, Artificial Intelligence and Renewable Energy. Author is currently working as an Ad-Hoc faculty in National Institute of Technology Warangal.