

SAHIS: Simulated Artificial Hybrid Intelligent System.

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ABSTRACT

SAHIS, (Simulated Artificial Hybrid Intelligence System) is an Artificial Life Form or a Quasi Human, which resides within a computer environment. SAHIS is designed to be a knowledge repository, which stores organizational decisions, and through a multidimensional matrix, helps to create action plans. SAHIS also examines previous decisions; mimics lateral thinking & what if scenarios. SAHIS is designed to interact with mechanical and electrical control systems, hence having the ability to become an intelligent control interface.

SAHIS is based on an attempt to merge the best facets of human decision making ability and the power of computing and software design. SAHIS isn't designed to an artificial intelligence or to become a human being, but rather to be a hybrid and function and exist within its own right. This paper is an overview of the philosophies that have driven the design phase of the process. A selection of concepts that make up the actually AL (Artificial Life) called SAHIS. I do not intend to enter into the debate about what is an artificial life, SAHIS has the ability to learn, question, lateral thing, record and suggest ideas for problem solution based on its experiences. SAHIS may be feed information by humans at the moment, but a robotic sensor form of SAHIS is in the designing process as well as the basic structures to interface with future technological advances. In comparison with human development, SAHIS is probability still a Newborn baby, but with the potential to learn and develop on the information feed to it, exactly like a human one. On a final note, to start to design a life form from scratch, with mapping out the various aspects, and then to go and try to create one is a daunting task. I believe that SAHIS is just a first step, and I am happy to discuss my work to anyone that is interested.

Goals of the project SAHIS.

- To explore and create an artificial life form.
- To investigate and map human decision-making.
- Redefinition of Life.
- Development of a desktop or portable decision support, with lateral thinking.
- To capture corporate knowledge and memory.
- To learn more about human interactions between emotions, knowledge & action.
- Model the human cognition and information behavior processes.
- Protection of a-lifes from abuse, neglect, exploration, and slavery.

Overview: Sahis is an attempt to create a computer system that could mimic human thought. To be able to mimic human thought you need to be able to replicate certain processes of human thought. The computer should be able to recognize different paradigms, concepts, ideas, knowledge, and emotions, and then include them in the analysis. In effect, it is a relational knowledge database that can examine and recognize both patterns and interrelationships. SAHIS is to have a workable and understandable interface so any user can easily relate to the data being presented for human analysis.

Methodology: Through using of a Finite Fuzzy Logic Granulated Clustering Hyperspace Euclidean Distance Matrix, there many different possibilities and opportunities open for the development and operations of Multi Dimensional Control Systems, Artificial Life Forms, Smart Probes, Decision Making, Signposting and Simulations. The matrix works on the theory of Bounded Rationality through Finite Mathematics, and Fuzzy Logic principles. An examination of previous works in philosophy and logic, this was expanded to include other

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disciplines such as management, information science, computer science, geometry, hyperspace mathematics, psychology, sociology, communications theory, learning, cognition, intelligence, knowledge, library classification systems, finite mathematics, critical thinking, neural networks, fuzzy logic, statistics, etc. This led to the observation, that the solution needs to be a cross discipline approach.

Outcomes: So far the benefits of this project have been the creation of the matrix. This has allowed the graphing of human decision-making, group thought and environment and criminal profiling. We have developed a better understand of human information behavior, the philosophy of decision making, logic, and fuzzy logic modeling and profiling. The artificial life form is designed to work in collaboration with humans, and not to be a slave / master relationship.

Future developments should be a-lives that can help human beings with decision making, lateral thing, problem solving and retaining corporate knowledge. They would be able to explore hazardous environments and be able to learn / report valuable analysis of the environment. They should show us ways to develop computer systems that can better interact with human beings, for more efficient interactions.

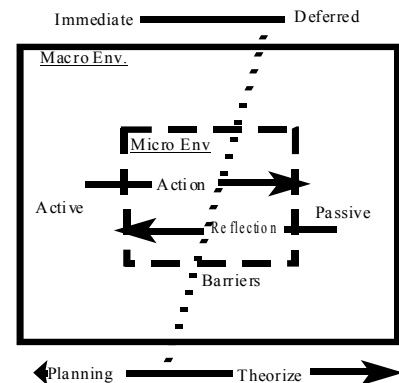
A self-reliant a-life or smart computer system, capable of maintain cognitive development and processes. Which through learning is able to build up a relationship with its environment as well as various interactions with mechanical or computer

Underpinning Philosophies.

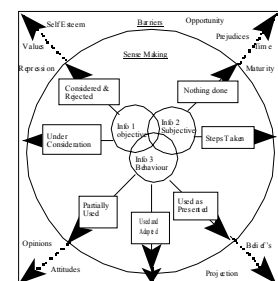
SAHIS is based on both human and computing backgrounds. For SAHIS to be an effective human computer interface, an historical look at how the human logic and philosophy had to be examined, and then modeled in combination with the cognitive science and information sciences theories. The resulting models that follow are a brief example of the type of philosophies that contributed.

The Action Philosophy Model

The action philosophy model is an adaptation of the action learning and decision making theories. Action learning is the name for the cycle of performing an ACTION, REFLECTING and PLANNING the next ACTION. The Action Philosophy draws from the realization that the ACTION LEARNING CYCLE is limited in that it is a cycle and that each component has to wait its turn, where as the action philosophy model is dynamic. In the diagram, the macro environment is the outside world in which we deal with. The microenvironment is our internal world, whilst the active and passive describe the degree of involvement we choose to take an active role or to be a passive observer. Immediate and deferred are the type of need, barriers are the problems we have with understanding and communicating, while planning and theorizing are our attempts to plan our next step.

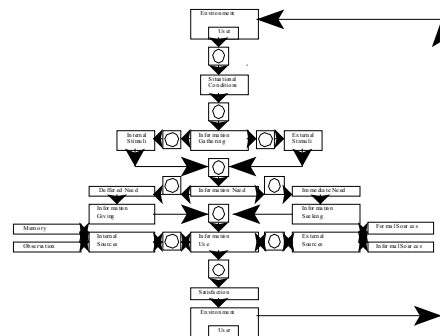


The Sense Making Process is how we understand our world and how we seek out information. The first diagram is the process of Sense Making, which is the process we go through in every step that we take in our decision making. This step is usually automatic and so natural that we are unaware of it if and when it happens. This is where we receive our stimuli, make sense of it, gain understanding of what it is, compare it against other stimuli and then prepare it for the information behavior processes described below. The Information Behavior Process is what we go through each time we need to make a decision, and how we seek out further information to help make that decision. The bottom model shows the process of



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information behavior. In the diagram below, the boxes with circles inside are representations of the sense making process above. This is more of a psychological view of the decision making process, and how we seek out information, and in that process deal with the various steps of information processing. However it is also important to note that the sense making process happens in each stage of the information behavior processes. At any time, information may be gained or lost, adapted, used or rejected.



Emotion and Cognition

When we make decisions, we don't always depend just on either the cognitive or the emotional. It is important for us to remember that we are both emotional and cognitive beings, and as such use both of these in our decision-making processes. It was often traditionally thought that the emotional side of decision making was a weakness, and bad for the decision making process in general. However, these days modern thought is that it is a strength to be aware of our emotional side and to use it whenever appropriate, and that it aids us in the decision making process.

It is not my intention to promote that computers are capable of emotional input. However I do believe that it is appropriate for computers to have some recorded knowledge of emotions, even if it is not directly experiences. Which I believe is the same way we treat knowledge that we don't directly have experience of, such as objects in space, etc. The following list is what I believe are a good range of emotional tags, which are involved in decision making.

- **Anger:** Fury, outrage, resentment, wrath, exasperation, indignation, vexation, acrimony, animosity, annoyance, irritability, hostility, hate and violence.
- **Sadness:** grief, sorrow, cheerlessness, gloom, melancholy, self-pity, loneliness, dejection, despair and depression.
- **Fear:** anxiety, apprehension, nervousness, concern, consternation, misgiving, wariness, qualm, edginess, dread, fright, terror, phobia and panic.
- **Enjoyment:** happiness, joy, relief, contentment, bliss, delight, amusement, pride, sensual pleasure, thrill, rapture, gratification, satisfaction, euphoria, whimsy, ecstasy and mania.
- **Love:** acceptance, friendliness, trust, kindness, affinity, devotion, adoration, infatuation and agape.
- **Surprise:** Shock, astonishment, amazement and wonder.
- **Disgust:** contempt, disdain, scorn, abhorrence, aversion, distaste and revulsion.
- **Shame:** Guilt, embarrassment, chagrin, remorse, humiliation, regret, mortification and contrition.

Emotional intelligence : why it can matter more than IQ / Daniel Goleman. London : Bloomsbury, 1996.

Decision Intelligence

Decision Intelligence aims to develop the understanding and aptitude of information used in decision making. The original themes involved in formulating decision intelligence include Action Philosophy, Cognitive Behavior, Critical thinking, Decision Analysis Human Interactions, Knowledge Management, Sense Making, Emotional Intelligence, Needs Analysis & Problem Solving. Essential to Decision Intelligence is the realization that human factors are fundamental in the transformation of Data and Information into

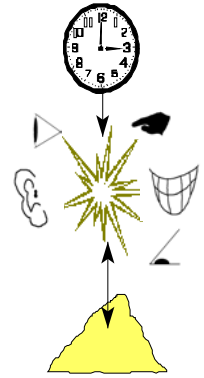


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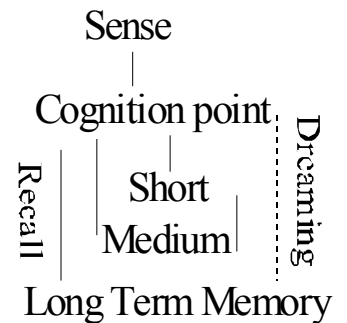
Knowledge and Information. Decision Intelligence is a good approach for the information / intelligence provider, because it demonstrates the concepts of decision making and the integration of knowledge and communication.

Now Philosophy.

Now philosophy is an attempt to examine and explain the interplay between time and memory in the decision-making process. Our understanding of the world comes from our 5 senses, and our memories of the interactions of those senses. These are then stored, in our long-term memory. However when we recall those memories, we integrate those memories with our sensory data, and our cognition at that time and space. As we are subjective beings and continuing changing and developing, we examine those memories and gain an understanding from a current mindset, rather than the mindset when we first experienced the sensory memory. For the information / intelligence provider this gives an insight into a persons development, and their ability to gain understanding Knowledge & Information Behaviour from the information provided. For the decision-maker, this helps them see the information, and their understanding of it into a better perspective. Remember - Experience is knowledge, the future is Faith.



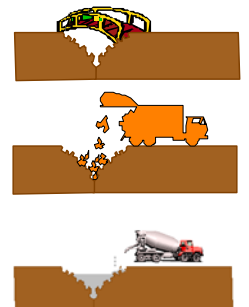
Recently there has been some reexamination in the area of memory and cognition. The newer theories state that we first gain sensory data from our senses and gain an understanding and shoot it into short-term memory. We then draw upon relevant memories from the long-term memory and then through the cognition point, gain an understanding, and in previous theories return the information to long-term memory. However we now believe that we put it into a medium-term memory for storage until the dream cycle. What have driven this new theory, is the newer understanding of the dream cycle, and the importance of it in decision-making. We have often heard the saying “I’ll sleep on it, and give you an answer in the morning”. We now know this process to be more the case, when in the dream state. We reprocess the day’s cognitive activities to a higher degree of analysis and role-play various scenarios over again, till we get the best sense making results. See this reference for interest in this topic. New Scientist 25th September 1999 No 2205



This process then has various cognitive actions. The information in question may be tagged as a Gap, and gets stored till much later on, where a different piece of information or experience may help provide a better sense making answer. If however the process is complete and there is no such gap, then the piece of information is stored in the memory centers of the brain. This can be either as reinforcement, where the new piece of information is the same as the resident-memory information, and hence the belief of the truth of such memory is strengthened.

Gaps in the Knowledge / Decision-Making Journeys.

If we can visualize that when are making a decision, we are taking through a ‘knowledge-scape’ with hills and valleys. Exactly like a journey through the landscape, however instead of trees and rocks, we have different areas of knowledge. As in the world example, we often have barriers in the journeys, like ditches and causeways. In the real world we bridge or fill them in, till we can cross and continue our journey. In the knowledge-scape we still find these barriers, however they are areas of non-understanding, or gibberish, etc. We still need to cross these barriers to complete our decision-making journey. We use intuition, imagination, and invention to bridge these gaps. We also use research, investigation, superstition, etc to fill in the gap with something that will let us cross. This is more long-term than a bridge, as it has a stronger building base, but it is not concrete as a direct experience. The final ending to the gap is the answer to the gap, or the belief that it has become concrete through experience and cognitive processes.



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Attributes Knowledge

Knowledge is not just a simple concept where the only piece of knowledge is going to have the same meaning for every one, or have the same interruption over space and time. Knowledge is a very dynamic thing, which expands, contracts, flows and stops, etc. It is individual to each one of use, and that is referenced by the situation in which we use that knowledge. However there is other knowledge which we believe to be objective knowledge or shared knowledge. Knowledge can indeed have many different attributes, which may change often. The concept map shows some of the diversity of knowledge, and the various possible combinations. When you get some time to reflect on the attributes of knowledge, try thinking about various pieces of knowledge, and then think of different situations, where that knowledge may change its attributes. Or different types of people, who may perceive knowledge in a different way than you do.

Fictional vs. Truth

- Fictional knowledge is when a person believes that the knowledge that is under consideration is based on imagination and invention. So that the knowledge has no factual basis in reality.
- True knowledge is when the person believes the knowledge to be factual, indisputably and based on reality.

Objective vs. Subjective

- Objective knowledge is when the person believes that the knowledge exists external to the person's perception, and exists in the outside world.
- Subjective knowledge is when a person believes that the knowledge under consideration is contained in a persons mind, and that piece of knowledge is subjective to the persons history, experiences, situation, emotional state and stresses at the current time.

Theoretical vs. Applied

- Theoretical knowledge is when the person believes that a piece of knowledge is a based on a theory and has theoretical applications for the person.
- Applied knowledge is when the person believes that the knowledge is based on a physical experience and has practical applications.

Abstract vs. Concrete

- Abstract knowledge is when a person experiences knowledge that isn't experienced through a persons five senses.
- Concrete knowledge is knowledge, which is experienced through a persons five senses.

Conventional vs. Radical

- Conventional knowledge is where the person believes that a piece of knowledge has conventional outcomes and has some form traditional back ground or acceptable standards.
- Radical knowledge is where the person believes that a piece of knowledge has extreme implications or outcomes and goes against acceptable standards.

Fun vs. Serious

- Fun knowledge is when knowledge takes on an entertainment, diversion or amusement function.
- Serious knowledge is when knowledge takes on solemn or grave implications.

Simple vs. Complex

- Simple knowledge is derived from a single element or object, where the input is achieved from that piece of knowledge.
- Complex knowledge is where the knowledge is derived from the combination of several pieces of other knowledge.

Recent vs. Historic

- Recent Knowledge is knowledge, which was created within a short period of time.
- Historic knowledge is knowledge that was created and been around for some period of time.

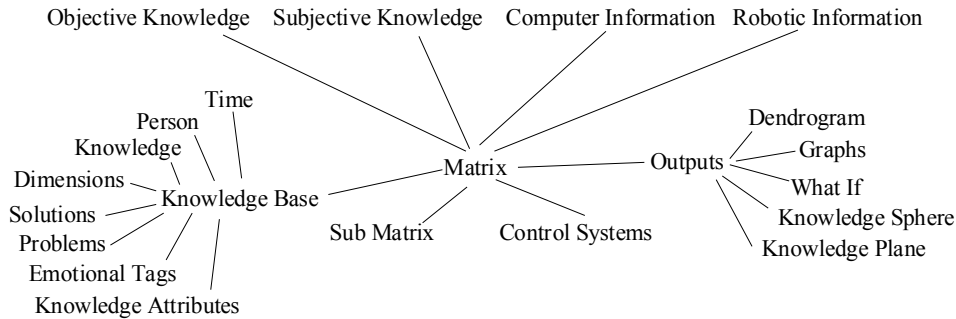
Faith vs. Experience

- Faith knowledge is knowledge, which has not been experienced, yet has been accepted as fact.
- Experience knowledge is knowledge that has been experienced, and is accepted as fact.

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Primary vs. Secondary

- Primary knowledge is knowledge that has been gathered directly by the individual.
- Secondary knowledge is knowledge that has been gathered through a 3rd party.



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