PRAXIS OF COGNITIVE ONTO-HERMENEUTICAL LOGIC ON LEARNING MACHINES

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PRAXIS OF COGNITIVE ONTO-HERMENEUTICAL LOGIC ON LEARNING MACHINES

by

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Finally, I would like to dedicate this work to my mother who is my inspiration all along.

TABLE OF CONTENTS

Page

LIST OF TABLES

Page

LIST OF FIGURES

Page

List of Acronym

ADS	Archeoductive Deep Structure
AI	Artificial Intelligence
AMT	Archeoductive Meta Transformation
ASS	Archeoductive Surface Structure
CD	Case-Distinguishers
DS	Deep Structure
DSP	Discourse Segment Purpose
EC	Event Calculus
EDD	Eye Direction Detector
GMEC	Generalized Modal Event Calculus
GRF	Global Reference Frame
HGMEC	Hermeneutic Generalized Modal Event Calculus
IC	Identity Condition
ID	Intentionality Detector
KB	Knowledge Base
LRF	Local Reference Frame
MT	Meta Transformation
MVL	Maximal Validity Intervals
NOHDLC	Neo -Onto-Hermeneutic Déjà Vu Life Cycle
ODS	Ontopretive Deep Structure
OMT	Ontopretive Meta Transformation

OSS	Ontopretive Surface Structure
SAM	Shared Attention Mechanism
SS	Surface Structure
ToBY	Theory Of Body Module
ToMM-1	Theory Of Mind Module 1
ToMM-2	Theory Of Mind Module 2

List of Symbols

$\exists$	*Existential Quntifier*
$\forall$	*Universal Quantifier*
$\equiv$	*Logically Identical To*
$\equiv_I$	*Logically Identical To Something For Intention (I)*
$\equiv_{I,t}$	*Logically Identical Be Referred Using Physical Temporal(T) Reference For An Intention(I)*
$\equiv_e$	*Extensionally Equivalent*
$\equiv_i$	*Intensionally Equivalent*
$\Leftrightarrow$	*If And Only If*
$\sim$	*Not*
$\wedge$	*And*
$\vee$	*Or*
$\Rightarrow$	*Implication*
ϕ	*Property*
$\Box$	*Necessary*
Γ	*Identity Condition (Ic)*
ρ	*Identity Criterion*
$\neq$	*Not Equal*
$\mathfrak{R}$	A Set Of Conceptual Relations
$\in$	*Member Of*
∇	*Presupposition*
$\subseteq_I$	*Subset For Intentional(I)*

$\prec$	*Prerequisite*
$\|\ \|$	*Cardinality*
$\subset$	*Proper Subset*
$P \times P$	*Cartesian Product*
$\oplus$	*Binary Operation (Concatenation Or Addition)*
ξ	*Sign*

PEMPRAKTISAN LOGIK ONTO- HERMENEUTIK KOGNITIF KE ATAS MESIN PEMBELAJARAN

ABSTRAK

Tujuan utama disertasi ini adalah untuk menyediakan satu sistem yang realitinya mudah dan ringkas yang dikenali sebagai *Pempraktisan Logik Onto-Hermeneutik Kognitif Ke atas Mesin Pembelajaran* di mana kesedaran manusia digabungkan dengan kajian Onto-Hermeneutik untuk merekabentuk Agen Bertekad (atau mesin pembelajaran) ke arah kecerdasan buatan (AI). *Pempraktisan Logik Kognitif Onto-Hermeneutik Ke atas Mesin-Mesin Pembelajaran* yang dalam percubaan untuk di struktur dan di praktiskan secara hermeneutic ontologikal yang boleh dikognitifkan oleh mesin-mesin pembelajaran dalam proses penghujahan. Hermeneutical Logics yang telah dimodelkan sebagai *Kitar Hidup Onto-Hermeneutik Terbaru Déjà vu* (NOHDLC) dalam disertasi ini secara dasarnya mengkaji prosedur penghuraian proses sosial yang dikongsi dalam kegunaan yang melibatkan dua agen iaitu aktor dan re-aktor dalam struktur logik matematik. Model ini menganalisis secara lengkap proses dan kejadian yang melibatkan interaksi manusia terhadap kaedah yang sesuai untuk persoalan saintifik dan untuk memindahkan kaedah tersebut sebagai mesin pembelajaran yang 'berjiwa'. NOHDLC bertindak sebagai sebuah model tindakan kecerdasan untuk mempelajari mesin serta mengawal logik kekaburan, ketidakjelasan dan kontradiksi dalam penghujahan.

NOHDLC melibatkan empat tahap utama iaitu: Ontological Commitment, Onto-pretation, Hermeneutical Archeoduction and Consumptive Illumination.

i) Ontological Commitment **(Komitmen Ontologis)** akan menganalisis fasa bagaimana proses melapiskan cadangan utama adalah munasabah dalam aktor. Menunjukkan ontologi (kewujudan fenomena) dalam memaparkan kewujudan (telah wujud) dan onto-presupposition (pemahaman awal tentang sejarah) dalam

penghujahan merupakan penggantungan terhadap proses yang mempunyai tujuan. Proses penggantungan yang bertujuan ini akan menjadi kandungan teras untuk fasa Ontological Commitment.

ii) Onto-pretation merupakan fasa sambungan kepada Ontological Commitment yang akan menganalisis pengintepretasian ontologikal (atau menjadi lebih sedar akan tujuan tersebut) oleh aktor dalam penghujahan. Onto-pretation merupakan proses eksplisit kognitif aktor dalam mentalisikan cadangan global ke dalam cadangan tempatan. Proses Onto-pretation hanya boleh diterangkan dengan menonjolkan konseptualisasi ontologikal ke dalam kejadian fizikal dengan menggunakan kaedah yang dikenali sebagai pengepisodan (perkembangan berepisod).

iii) Hermeneutic Archeoduction akan menganalisis fasa yang menggabungkan (pegangan yang bertujuan dengan bersebab atau sebaliknya) di antara aktor dan re-aktor dalam penghujahan. Proses ini adalah percubaan re-aktor untuk MELIHAT realiti yang kekal tersembunyi dalam dunia kognitif aktor-aktor (atau untuk memahami tahap onto-pretation dalam aktor). Tindakan untuk menstrukturkan pengetahuan ontopretif aktor oleh re-aktor dengan menggunakan kaedah penemuan atau melalui elisitasi yang dikenali sebagai Hermeneutical Archeoduction.

iv) Consumptive Illuminative merupakan fasa yang terakhir dalam NOHDLC. Fasa ini akan mensintesiskan secara keseluruhan membuat penafsiran penghujahan dengan mendedahkan sasaran penghujahan global. Dalam terma yang lain, Comsumptive Illumination merupakan satu percubaan re-aktor untuk menggunakan huraian secara realiti ataupun realiti penghujahan yang akan menerangkan re-aktor yang sewajarnya difahami oleh aktor ke arah SASARAN (suatu tahap di mana re-aktor bergabung tekad dengan aktor). Pencapaian ini membolehkan re-aktor untuk menormalkan struktur yang tidak elok seperti kontradiksi, kekaburan dan ketidakjelasan dalam penghujahan kepada bentuk struktur yang lebih baik.

NOHDLC mempamerkan onto-hermenuetic yang unik dan boleh diaplikasikan dengan berjaya dalam pelbagai bidang spesifik yang memerlukan hermeneutik sebagai permintaan utama seperti perancangan, analisis ontological, analisis kognitif, analisis bahasa dan linguistik, analisis sistem semiotik, komunikasi dan analisis penghujahan serta lain-lain bidang yang relevan.

PRAXIS OF COGNITIVE ONTO-HERMENEUTICAL LOGIC ON LEARNING MACHINES

ABSTRACT

The primary purpose of this dissertation is to provide a relatively simplistic system called Praxis Of Cognitive Onto-Hermeneutical **Logic On Learning Machines** in which the human consciousness, be incorporated into the study of onto-hermeneutic, to design Intentional Agent (or Learning Machine) at the leading edge of the Artificial Intelligence (AI)**.** Praxis Of Cognitive Onto-Hermeneutical Logic On Learning Machines is an attempt to structurally and logically construct the practice of ontological hermeneutics(applying the technique of intepretation in the existence of phenomena) which can be cognized by the learning machines in its discourses. The ***hermeneutical logic(logic of intepretation)*** architecture which has been modelled as **Neo -Onto-Hermeneutic Déjà Vu Life Cycle (NOHDLC)** in this dissertation is intended to reveal the explanatory procedures of social events shared in a discourse by two agents called ***actor*** and ***reactor*** in structural mathematical logics. This model will compactly analyse the processes and events of human interaction to the methods suitable for scientific enquiries and to transmigrate the methods as the "psyches" of learning machine (intentional agent) in Artificial Intelligence. The NOHDLC act as suitable intelligent behavior model for learning machine to handle the logics of **ambiguity**, **vagueness** and **contradictions** in a discourse.

NOHDLC involves four major cyclic phases: Ontological Commitment, Onto-pretation, Hermeneutical Archeoduction and Consumptive Illumination.

i) Ontological Commitment phase will analyse how the process of laying a prior intentional ground is possible within an actor. Committing ontology(the existence of phenomena) into intention by framing the existence(being exist) and onto-presupposition (pre-understanding of history) in a discourse are a

relaying intention process.This relaying intention process will be the core content of Ontological Commitment phase.

ii) Onto-pretation phase is a continuity of Ontological Commitment phase which will analyse the ontological interpretation state (or becoming aware of intention) of an actor in a discourse. Onto-pretation is process of an actor's explicit cognizant process of compartmentalizing the global intention into local intentions. This process of Onto-pretation can only be elucidated by projecting ontological conceptualization into physical events using the method called episodization(episodic progression).

iii) Hermeneutical Archeoduction phase will analyse the engaging (grasping of intention causes or discloses) process between an actor and a reactor in a discourse.This process is a reactor's attempts to SIGHT a reality that remains hidden in the actor's cognition world (or to understand the onto-pretation state of an actor). The act of structurally extracting the ontopretive knowledge of an actor by the reactor using a discovery or elicitation method is called Hermeneutical Archeoduction.

iv) Consumptive Illumination is the last phase in the NOHDLC. This phase will synthesize the whole interpretive exercise of a discourse by unearthing the global goal of the discourse. In another term Consumptive Illumination is a process of a reactor's attempts to consume the "discourse reality" which will illuminate the reactor's absolute understanding towards actor's GOAL(a state where the reactor intentionaly fused with the actor). This attainment enables the reactor to normalize the ill-structured states like contradiction, vagueness and ambiguity in a discourse into well structured and well mended form.

The NOHDLC exhibit an unique onto-hermeneutic properties that can be successfully applied into many specific disciplines like, planning, ontological analysis, cognitive analysis, language and linguistic analysis, semiotic system analysis, communication or discourse analysis etc., in which hermeneutic is a primary requirement.

CHAPTER 1

INTRODUCTION

1.0 Background

In many ways, the idea of a machine that can learn from its own interactions with the world has been one of the driving forces behind artificial intelligence research since its inception (Turing, 1950) . The most powerful form of this grand challenge is a learning machine that could master new skills and abilities by interacting with another learning machine in the same way that a human might attempt to learn a new skill from another person. This dissertation titled ***Praxis Of Cognitive Onto-Hermeneutical Logic On Learning Machines*** is an attempt to structurally and logically construct the practice of ontological hermeneutics which can be cognized by the learning machines in its discourses.

The grand challenge of building machines that can learn and interpret naturally from their interactions with other learning machine raises many difficult questions and constraints, but also offers the hope of overcoming the scaling problem by little cumulative progress. One area which has not received a great deal of attention from the computer science and mathematics community, but which has been studied extensively in philosophy, psychology and linguistics often goes by the name "Hermeneutic Science". Hermeneutics, the theory and practice of interpretation, is governed by a belief that even as the world may exist independently of humans, it cannot present itself directly to the human gaze. It attends to the process through which the humans develop an understanding of the world. The hermeneutic task can be seen as an uncovering of meaning, but a historically situated meaning dependent on the media and experiences through which it is observed.

The meaning of any mathematical logic and its representation goes beyond that which would be found in a purely literal or symbolic investigation and cannot be separated from its observer and the context in which it arises. In a social situation encompassing mathematical learning, a variety of linguistic forms will be used within a broad communicative environment. The ***Hermeneutical Logic*** architecture which has been modeled as **Neo -Onto-Hermeneutic Déjà vu Life Cycle**

(NOHDLC) in this dissertation intends to reveal the explanatory procedures of social events shared in a discourse by two agents called ***actor*** and ***reactor*** in structural mathematical logics. Remember mathematics can only be shared as a precise logical communicative medium in a discourse but the act of realising mathematical contents in a discourse bring mathematics much beyond the bare symbols called *Pragmatism*.

Pragmatism is a task to ascertain the laws by which in every scientific intelligence one sign gives birth to another, and especially one thought brings forth another. Pragmatics is the *study that relates signs to the agents who use them to refer to things in the world and to communicate their intentions about those things to other agents who may have similar or different intentions concerning the same or different things*. (Ganter,et al. 2000)

1.1 The Problems and challenges of Praxis Of Cognitive Onto-Hermeneutical Logic On Learning Machines.

In the terms of Artificial Intelligence, **Praxis Of Cognitive Onto-Hermeneutical Logic On Learning Machines** is an attempt to represent the hidden state of intention maintained by an actor agent towards the reactor agent in a discourse. Based upon the observable actor's communicative 'behavior', the reactor agent is able to interpret and learn the actor's actual intention that has been conveyed to it and react accordingly. This set of abilities is also sometimes known as the ability to "mentalize" (Frith and Frith, 1999) or the ability to "mindread" (Baron-Cohen, 1995). But in this dissertation, two new terms called Ontopretation (the ability to "mentalize" the actors hidden state) and Archeoduction (the ability to "mentalize" the reactors hidden state) to clearly distinguish and visualize the progressive hidden states of both actor and reactor in a discourse are given.

As we observe the behavior of other people, we naturally attribute to them percepts, and other mental states that we cannot directly observe. Human social dynamics are critically dependent on

the ability to correctly attribute presupposition percepts to other people. The ***ontological hermeneutics (Onto-hermeneutic)*** is an indept effort of this dissertation to elaborate and allows us to understand the actions and expressions of others within an intentional or goal-directed framework (what Dennett (Dennett D. C.,1987) has called the intentional stance). The recognition that other individuals have presupposition, and intentions that differ from our own is a critical step in a discourse and **NOHDLC** is, providing a hermeneutical grounding instrument during language decoding and possibly in the progression of constructive discourse. If the reactor could recognize the intention of the actor would allow for a communicative systems that can more accurately react to the cognitive states of the actor and can modify its own behavior accordingly.

However, severe communicative disorders termed as "***autistic hermeneutics***" may lead to disintegration of the communicative structure which is failing to form hermeneutical grounding instrument in a discourse. For example autistic children often appear completely normal on first examination; they look normal, have good motor control, and seem to have normal perceptual abilities. However, their behavior is completely strange to us, in part because they do not recognize or respond to normal social cues (Baron-Cohen, 1995). They do not maintain eye contact, recognize pointing gestures, or understand simple social conventions.

Therefore qualitative impairment in social interaction, communication, and restricted repetitive and stereotyped patterns of behaviour, interests, and activities which are perverting the learning of cognitive state of a discourse is called "***autistic hermeneutics***".

Autistic hermeneutics in a discourse may lead to almost psychotic blindness to an agent *experiences* of knowing, learning, communicating, formulating, recognising, adapting and reacting. It is characterised by social disconnectedness, failure to recognise and read the subtleties of communicative structure and interactions, an obsessive addiction to routines and repeatable behaviours, and what psychiatrists call *meaningless noncontextual echolalia*, the repetition of

sentences and words without regard to their significance or the context in which they are spoken (Patrick Lambe, 2002).

1.2 Objectives

The work presented in this thesis is an attempt to construct an embodied system capable of performing many of these foundational skills for an Onto-hermeneutic. The implementation will be based on model of NOHDLC which account for interpreting method of a discourse. The goal of this implementation can be described in four-fold:

i) To examine the feasibility of applying the technique of interpretation in the existence of phenomena which caused can be cognized by the learning machines in its discourse.

ii) To model Neo-Onto-Hermeneutic Déjà vu Life Cycle(NOHDLC) based on hermeneutic logics revealing the explanatory procedures of social events shared in a discourse by two agents called actor and reactor.This NOHDLC model will reveal the internal composition of intentional discourse organization and provide the visual disintegration of communicative structure called "***autistic hermeneutics***". The NOHDLC model is a structural method which will form hermeneutical grounding instrument in a discourse.

iii) To provide structural mathematical logics as a representation of theoretical principles that can support social learning mechanisms of any discourse as a solid ground work of intentional discourse organization.

iv) To demonstrate unique onto-hermeneutics properties and applications of NOHDLC like presupposition,existentiality, episodization, temporality, "hermeneutic causality" and Hermeneutic Generalized Model Event Calculus.

1.3. Methodology

It should be made clear at this point that the work presented here is not being proposed as an explicit model of how NOHDLC develops in humans. Although the work presented here is based extensively on models of human performance, the success of this model in presenting similar behavior on the agent does not imply that similar behavior observed in humans results from the same underlying structure. However, model will provide a proof of concept that certain aspects of popular human models may not be necessary to generate the observed behaviors.Basically the research methodology that are being applied in NOHDLC is more on introducing ideas ,concepts,stipulated definitions,assumptions,theorems and proofs which are qualitative and deductive in nature.

Basically there are three main phases involved in the research

a) Preliminary study of building a machine that can learn and interpret naturally from their interactions with other learning machines using the philosophically derived axioms and qualitatively inducted cognitive analysis and discourse analysis by prominent domain experts.

b) Designing a model called Neo-Onto-Hermeneutic Déjà vu Life Cycle(NOHDLC) that uses onto hermeneutic logics .There are four main phases in NOHDLC model:

   - Ontological Commitment
   - Onto-pretation(Axiomatization)
   - Hermeneutical Archeoduction
   - Consumptive Illumination

c) Provide structural mathematical logics like new definitions, theorems, assumptions and proofs as a representation of theoretical principles that can support social learning mechanisms of any discourse.

d) To stipulate and deduct unique methodology using collective premises and supporting evidences from various new discovery for onto-hermeneutics properties and applications of

NOHDLC like presupposition,existentiality, episodization, temporality, "hermeneutic causality" and Hermeneutic Generalized Model Event Calculus.

1.4 Contributions

The contributions of this dissertation are:

i) Neo -Onto-Hermeneutic Déjà vu Life Cycle (NOHDLC) as structural model of discourse for learning machine.

ii) Introducing the **predicate of existence** which will resolve the enigma of existence.

iii) Redefining the ontological commitment by introducing the onto **presupposition** and **intentionality** as a major embedded components.

iv) Conceptualize new Intensional Relations for ontological stances.

v) Redefining the Situation as a resource provider for the local intentions to construct episodes.

vi) Meta-text at metatransformation layer as a meta knowledge repositories and knowledge representation.

vii) Revealing the dual coexistent structure of "hermeneutic causality" as a solution for the limitation of the physical causality.

viii) Defining mutual and intrinsic properties of entities.

ix) Deriving the cognitive time (referred as ordinal time) and physical time (referred as cardinal time).

x) Formulating the method for Archeo- Knowledge Discovery, Archeo-Knowledge Acquisition and Archeo-Knowledge Audit.

xi) Resolving Ontical –enigma and Onto-enigma crisis.

xii) Providing new dimension of approach to Historization in the building component of presupposition.

xiii) Proving the existence of Temporality as progress state of global intention which scaled into Intentional Time or psychological time.

xiv) Deduct the archeoductive efforts to resolve the contradicting, vague or ambiguity problems in the discourses.

xv) Visual formulation of the Act-Turn and fusion of intentions by the reactor with actor.

xvi) Constructing Onto-Hermeneutic semiotic system as a set of relational entities, semiotically formed under AXIOMATIC TRUTH stance and represented as a primary meaning of a sign (icon,symbol or index) in a discourse.

xvii) NOHDLC is proposing Hermeneutic Generalized Modal Event Calculus (HGMEC) to resolve any hermeneutic based agent's problems.

1.5 . Overview

Chapter 1

This chapter as a general introductory portion contains the background of the problem domain, objectives, methodology and contribution of the dissertation.

Chapter 2 :

We begin with a discussion of the general theoretical definitions of discourse, interpretation, hermeneutics, hermeneutics in artificial intelligence (AI), onto-hermeneutic and learning machine that have been employed in building NOHDLC. Certain assumptions about the nature of discourse and hermeneutic structure that are found in classical and moden philosopical research are included to emphasize the developmental progression of major principles of social interaction in learning machines.

Chapter 3 :

In this chapter the concepts and general theoretical definitions of consciousness and its causal relationship of Temporal Binding, intention, agent and time are discussed.

Several major concepts that are found in classical and moden philosopical research on those field are included to stretch and to strengthen the employment of theoretical foundation in NOHDLC.

Chapter 4 :

This chapter presents the discussion and conceptual building of onto-hermenuetic logics and the intentional organization of Interactions**.** The agents were constructed in part to support the implementation of the embodied onto-hermenuetic logics model. The capabilities of these agents that are relevant to social interaction are discussed in this chapter. The detail construction and implementation of ontological commitment phase will be disccused in this chapter.

Chapter 5 :

The detail construction and implementation of onto-pretation phase with its algebraic representation will be presented in this chapter. This chapter contains conceptual and mathematical social interaction design for an actor.

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Chapter 6 :

In this chapter ,the detail construction and implementation of hermeneutical archeoduction and consumptive illumination of Neo-Onto-Hermeneutic Déjà Vu Life Cycle (NOHDLC) will be described with its algebraic representation. This is an extensive chapter, which contained conceptual and mathematical social interaction design for a reactor.

Chapter 7 :

In this chapter some of the potential areas of future applications that can be adapted into NOHDLC model are demonstrated. Future potential development and application of individual components in NOHDLC are performed throughout the chapters using both comparisons and subjective mimicry to agent performance on similar models.The conclusion of the dissertation as a final remarks has been given.

CHAPTER 2

DISCOURSE ANALYSIS

2.0 Discourse

Discourse analysis focuses on the knowledge about language beyond the word,clause,phrase and sentence that is needed for successful communication.It looks at patterns of language across texts and considers the way that the use of language presents different view of the wolrd and different understandings.It examines how the use of language is influenced by relationships between participants as well as the effects the use of language has upon social identities and relations.It also considers how ***views of the world, identities,are constructed*** through the use of **discourse**. (Blommaert, J. 2005).

According to Barbara J. Grosz (Barbara J. G., 1986) , a discourse is a communicative behavior that typically involves multiple utterances and multiple participants with intention as a discourse purpose. A discourse may be produced by one or more of these participants as actors; the audience may comprise one or more of the participants as reactors and the discourse purpose is the intention that underlies engaging in the particular discourse. There is a two-way interaction between the discourse segment structure and the messages constituting the discourse: linguistic expressions (as connotation or denotation) can be used to convey information about the discourse structure; conversely, the discourse structure constrains the interpretation of expressions (and hence affects what an actor does and how a reactor will interpret what is conveyed). Linguistic expressions are among the primary indicators of discourse segment boundaries.

The structure of any discourse is a composite of three distinct but interacting components (Barbara J. G., 1986) :

- the structure of the actual sequence of utterances in the discourse;
- an attentional state;

- a structure of intentions.

Structure of the actual sequence of utterances

The linguistic structure's basic elements are sequences of phrases and clauses which later can be interpreted according to the syntax and semantics formation. In NOHDLC this actual sequence of utterances structure will be analyzed in ***Surface Structure*** and the utterances structure will be approached as a sequence of events.

An attentional state

Attentional state, serves during processing to coordinate the linguistic and intentional structures. The attentional state component is not equivalent to cognitive state, but is only one of its components. Cognitive state is a richer structure, one that includes at least the knowledge, beliefs, desires, and intentions of an agent, as well as the cognitive correlates of the attentional state. In NOHDLC this attentional state which is a meta-state of a discourse will be positioned in the ***Meta Transformation Structure***.

A structure of intentions

The intention provides both the reason a discourse (a linguistic act), rather than some other action, is being performed and the reason the particular content of this discourse is being conveyed rather than some other information. For each of the discourse segments, we can also single out one intention **- the discourse segment purpose** (DSP). From an intuitive standpoint, the DSP specifies how this segment contributes to achieving the overall discourse purpose. In NOHDLC this structure of intentions will be located in the ***Deep Structure*** and the DSP will be analysed as episodic meta state of local intentions.

2.1 Interpretation

Interpretation, the true subject of semiotics, begins with perceptual paradigms, which are abstractions from perceptual patterns. Abstraction is the process of defining a concept based on an observation, mental or perceptual, hence all abstractions are concepts. A sign is an association of a perceptual paradigm with another concept. This association is made through memory: two concepts are associated when they occur in the same thought experience; thinking of one will then cause the recall of the entire experience, in which the other concept is also present. Interpretation is the process of fitting observed percepts into recognized paradigms, thereby deriving meaning, which is nothing more than the association of concepts. Interpretation applies to all aspects of the perceptual realm. It is a means of constructing a personal version of the perceptual realm — an attempt to reconstruct the actual course of events in the world. (Holdcroft D.,1991)

"The work of interpretation is to understand what at first appears alien and than participate in the production of a richer, more encompassing context of meaning—we gain a better and more profound understanding not only of the text but also of ourselves. In the fusion of horizons, the initial appearance of distance and alienness does itself emerge as a function of the limitations of our own initial point of departure (Ramberg B,Gjesdal K,2007)."

2.2 Hermeneutics

Hermeneutics is the art of interpreting. Although it began as a legal and theological methodology governing the application of civil law, canon law, and the interpretation of Scripture, it developed into a general theory of human understanding through the work of Friedrich Schleiermacher, Wilhelm Dilthey, Martin Heidegger, Hans-Georg Gadamer, Paul Ricoeur, and Jacques Derrida. Hermeneutics proved to be much bigger than theology or legal theory. The comprehension of any written text requires hermeneutics; reading a literary text is as much a hermeneutic act as interpreting law or Scripture.

Hermeneutics grounds the meaning of texts in the ***intentions and histories*** of their authors and/or in their relevance for readers*. Hermeneutics regards text as means for transmitting experience, beliefs and judgments from one subject or community to another*. (John C.M, et al., 1986)
Interpretation might rely on ***empathetic understanding***, the interpreter's self projection into the author's space. As what claimed by Betti and Hirsch (Betti and Hirsch.,1962) , interpretations become more valid as they assimilate more knowledge about the author and the author's values, instead of reflecting the interpreter's own values sense of reality. Ricoeur (Ricours .P ,1971) was also sharing the knowledge by saying "once objective meaning is released from the subjective intentions of the actor, multiple acceptable interpretations become possible.Thus the meaning is construed not just according to the actor world-view but also according to its significance in the reactor's world-view."

Schleiermacher (Gadamer, 1975) defines hermeneutics as ***'the art of avoiding misunderstandings'***. Hermeneutics rises above the pedagogical occasionality of interpretation and acquires the independence of a method, inasmuch as 'misunderstanding follows automatically and understanding must be desired and sought at every point'. Schleiermacher's concept of understanding includes empathy (projective introspection) as well as intuitive linguistic analysis.

Without collapsing critical thinking into relativism, hermeneutics recognizes the historicity of human understanding. Ideas are nested in historical, linguistic, and cultural horizons of meaning. Understanding of past, undoubtedly requires an historical horizon. But it is not the case that agent acquire this horizon by placing itself within a historical situation. Rather, it must always already have horizon in order to be able to place itself within a situation. (Gadamer, 1975) For what of true of the communicated source, that every sentence that has been communicated can be understood only from its *context or situation,* is also true of their content*.* Its meaning is not fixed. The historical context in which the individual objects, of historical research appear in their true relative

meaning is itself a whole, in terms of which every individual thing is to be understood in its full significance, and which in turns, is to be fully understood in terms of these individual things.

Hermeneutics is imparting the practice of historical retrieval, the re-construction of the historical context of presupposition in a discourse. Hermeneutics does not re-construct the past for its own sake; it always seeks to understand the particular way a problem engages the present. By addressing questions within ever-new horizons, hermeneutic understanding strives to break through the limitations of a particular world-view to the matter that calls to thinking.

The structural interpretation brings out both surface and a depth interpretation.The depth semantics is not what the actor intended to say but what the reactor is about,the non-ostensive references of the reactor.The hermeneutic that moves from objective world(perception) to subjective world(understanding) incrementatilly constructs the world that lies behind the text but must rely on the world-view of the interpreter for its pre-understanding.Although the constructed world-view may gradually approximate the actor's as more action of actor is interpreted, the interpreter's subjectivity cannot be fully overcome.Understanding requires an affinity between reactor and aboutness of the actor(Ramberg B,Gjesdal K,2007). The **NOHDLC will adopt this new theory as its a fundamental assumption and the Consumptive Illumination phase absolutely modeled based on this theory.**

2.3 Hermeneutics in Artificial Intelligence (AI)

So far, few AI researches have attempted to adopt AI techniques to hermeneutics and thereby develop computational models of interpretation. As AI interest in action and social discourse deepens, researchers will have to give hermeneutic insights a prominent place in thinking about the organization of these phenomena and the ability of AI models to capture their unfolding. Their ***modeling efforts are not likely to be very useful if they do not take into the account the variability of meaning according to the actor's intentions and observer's perceptions and also the extent to***

which the modeling efforts themselves impute-rather than recognize-particular organization in the phenomena under study. (John C.M, et al., 1986)

Hermeneutics readily lends itself to the disciplines within the human sciences, which in general, "deal with the world of meaningful objects and actions (as opposed to physical objects and events in themselves)" (Brian M.S,2001) . **Praxis Of Cognitive Onto-Hermeneutical Logics On Learning Machines** is really an attempt to link hermeneutic logic capabilities with a discourse cognitive model which deal with the world of meaningful objects and actions. The model of **NOHDLC** as a way of bridging between **hermeneutic** phenomena and **semiotic** systems **in Praxis Of Cognitive Onto-Hermeneutical Logic On Learning Machines** is an integrated effort of various disciplines like social science, linguistic , psychology, computer science, education, philosophy ,etc.This introspective deep structure design has led AI to its original goals of building simple, versatile, **hermeneutic** architectural system and towards the construction of **hermeneutic** architectural systems capable of performing wider interpretation on semiotic domains and in various situational condition. This model can be an appropriate and useful primary building tool for any **hermeneutically** grounded systems. Of course, learning machine techniques for building sequences of actions in a discourse using cognitive and onto hermeneutic cues to improve communicative structure and message dissemination would be central to this dissertation endeavor.

2.4 Onto-hermeneutic

The onto hermeneutic logics will be used on NOHDLC to translate the events to the methods suitable for scientific enquiries and learning machines in the Artificial Intelligence. For any discourse the actor's intentional and behavioural displays are critical in establishing the foundational context of reactor and provide a way of capturing, a shared understanding of categories of things that exist or may exist in some domain that can be used by both communicators to aid in information exchange and integration.

The connotation of a word in a discourse is absolutely contextual dependent. The NOHDLC emphasis on **onto-hermeneutic** usage in a discourse, echoes (Wittgenstein,1958, p.20) who in "Philosophical Investigations" suggested that, the meaning of a word might be seen as its usage in language and is thus dependent on both situation and time. This offers an alternative to seeing words as having inherent meaning and a key to analyzing expressive activity as action; to say a sentence is to perform an action, an action that takes place through time. The meaning of a sentence, seen as an action, is related to its perceived effect in a social situation. **Onto-hermeneutic** will help to decipher the effect of a sentence offered in a social situation in different structural layer and establish the foundational context for ontology and conceptualization.

2.5 Learning Machine

A system is said to learn if it is capable of acquiring new knowledge from its environment or applying new or different behaviour to a specific set of circumstances which the agent or the organism believes will be to its benefit. Learning may also enable the ability to perform new tasks without having to be redesigned or reprogrammed, especially when accompanied by generalization (Bill L.,et al.,2007). Learning is most readily accomplished in a system that supports symbolic abstraction, though such a property is not exclusive (reinforcement strategies, for example, do not necessarily require symbolic representation). Learning is a relatively permanent change in behavior that is attributable to practice and experience, and is inferred from improvement in performance.

Cognitive theorists view learning machine as involving the acquisition or reorganization of the cognitive structures through which the agent(machine) process and store information. (Good and Brophy, 1990, pp. 187) .The learning machine able to shift its response even though the stimulus-situation and the motivation are essentially the same (Weick K.E,1991) .

In this dissertation the learning machine will use the model of NOHDLC to learn and support symbolic abstraction. This is only possible when a machine is able to recognize the historicity and presupposition of its own "*thrownness*" (the term given by Heidegger). "Thrownness" denotes that an agent is thrown into the situations of where it is require making decision from its own effective histories by using heuristic.The NOHDLC act as suitable intelligent behavior model for learning machine to handle the logics of ambiguity, vagueness and contradictions in a discourse.

CHAPTER 3

COGNITIVE ANALYSIS

3.0 Consciousness

Since Praxis Of Cognitive Onto-Hermeneutical Logic On Learning Machines research orientation is on the deep logical structure of cognitive state (which is consciousness), it is necessary to analyze the properties of consciousness in such a way that it can be interpreted and can be applied into learning machine .

The Collins Concise Dictionary defines consciousness as “denoting a part of the human mind that is aware of a person’s self, environment and mental activity and that to a certain extent determines his choice of actions”.

Consciousness is hard for materialists to explain because it seems that no matter how much one knows about neurons, there's something that's still not explained about consciousness the term consciousness is very hard to define.

A quick overview of five ways in which we use the term "conscious".	
1. John is conscious (i.e. he's not asleep or drugged)	-- **"creature consciousness"**
2. The desire/belief/perception was conscious	-- **"state consciousness"**
3. John is conscious of the bad smell; he detects and can respond to it	-- **"perceptual awareness"**
4. John is conscious of his own limitations	-- **"self-awareness"**
5. There is "something that it is like" to be that entity	-- **"qualia", "qualitative consciousness", "phenomenology"**

Table 1: Five ways in which we use the term "Conscious".
Adapted from Brentano & Intentionality (Colin P., 2006).

Some philosophers think that the best theory of state consciousness (2) is that it depends on self-consciousness (4) -- a conscious thought is one that you can think about. A thought about a thought is sometimes called a **"higher-order" intentional state**. A "first order" intentional state is one whose content makes no reference to any other intentional states. Second order states can refer to first order states, and so on.

Some philosophers also think that qualia (5) are best explained as higher order intentional states. But this is very puzzling for we also have the intuition that, for example, many animals feel pain (thus there is something that it is like to have their experiences) even though they may be incapable of thinking about their own mental states.

"Any form of conscious awareness thus also necessarily demands ***self reference*** and that one is consciously self-aware.This does not imply however that all conscious cognition involves awareness of ones 'self-construct' or 'self model'. Rather, that by virtue of logical necessity, all conscious aware cognition requires ***self reference"*** (Peter Lynds, 2003).

Ricoeur(Ricours P.,1966) asserts that a consciousness is always a consciousness of something. This is not to say that the subject is conscious of a discreet object which it sees as the other, but rather the basic datum of experience at its most immediate level is the ***intentional unity of subject and object from which both the concept of a pure subject and of a pure object are subsequently derived by reflexive consciousness*** (Ricoeur P., 1966, translator's introduction, p. xiii) . It is being declared, more or less by that "cognition" is computation (Harnad, S. 1999).

The latest well known research of Francis C and Christof K (Francis C , Christof K, 2002), indicated counsciousness in term of competing cellular assemblies.This theory is buying the theory of temporal binding which was enacted by the Newman (Newman and Grace,1999).

3.0.1 Consciousness as a causal relationship of Temporal Binding

Daniel Dennett (Dennett D.C.,1991) asserting that conscious awareness is not the historically widespread notion of the presentation of data to a mytical subject (the mind), but is rather the sum total of all data streams taken together or as what Crick (Crick F., 1994) ., Engel et al. (Engel, et al.,1999) , and Newman (Newman and Grace,1999) reenacted the ***consciousness*** term as a ***causal relationship of Temporal Binding***.

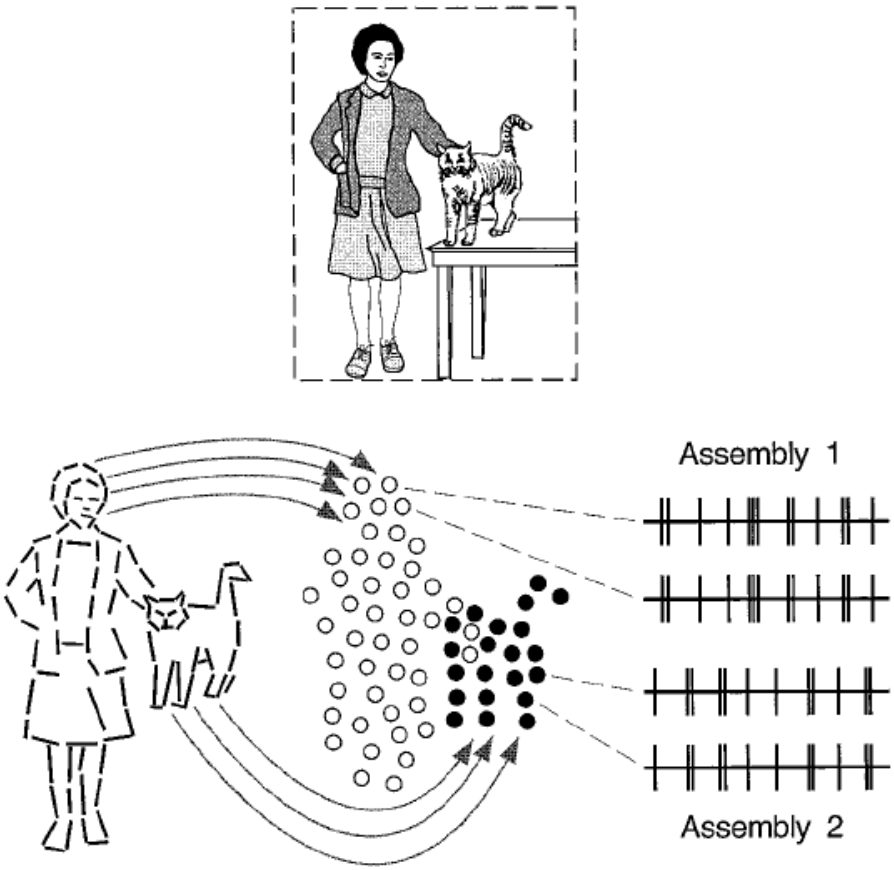

Figure 1:Establishment of coherent representational states by temporal binding.
This figure is taken from : "Temporal Binding, binocular rivalry and consciousness. Engel, A.E, Fries P., Konig, P., Brecht, M., Singer, W., (1999)".

"The model in the figure 1 assumes that objects are represented in the visual cortex by assemblies of synchronously firing neurons. In this example, the lady and her cat would each be represented by one such assembly (indicated by open and filled symbols, respectively). These assemblies comprise neurons which detect specific features of visual objects (such as, for instance, the orientation of contour segments) within their receptive fields (lower left). ***The relationship between the features can then be encoded by the temporal correlation among these neurons*** (lower right). The model assumes that neurons which are part of the same assembly fire in synchrony, whereas ***no consistent temporal relation is found between cells belonging to different object representations***" (Peter Lynds, 2003).

‘‘Binding problem’’ arises for several reasons:

i) Information processing underlying cognitive functions is typically distributed across many network elements and, thus, one needs to identify those neurons or network nodes that currently participate in the same cognitive process (Hinton et al.,1986)

ii) Perception of an action in a complex environment usually require the parallel processing of information related to different objects or events that have to be kept apart to allow sensory segmentation and goal-directed behavior (Peter Lynds, 2003).

iii) It has been claimed that specific yet flexible binding is required within distributed activation patterns to allow the generation of syntactic structures and to account for the systematicity and productivity of cognitive processes (Fodor and Pylyshyn,1988).

iv) Many cognitive functions imply the context-dependent selection of relevant information from a richer set of available data. It has been suggested that appropriate binding may be a prerequisite for the selection and further joint processing of subsets of information (Singer and Gray, 1995); (Singer W.,et al.,1997).

The above review on neuro–biological evolution is an accumulated evidence for the role of ***a brain linking neural networks to select and "stream" conscious episodes across time***. The **NOHDLC** is a ***causal relationship of Temporal Binding model which stream the conscious episodes across physical and psychological time in dual concrete layers.***

3.1 Intention

Intentional phenomenology has made the mind as mind, the field of systematic experience and science and thus totally transformed the task of knowledge. Dilthey (Dilthey,et al.,1996). The attribution of intention to an object is often characterized as a complex, high-level cognitive task involving reasoning and ***episodic memory in AI discipline***.

3.1.1 Dennett and His Intentional Stances

Dennett (Dennett D. C.,1987) has focused on how organisms naturally adopt an "intentional stance" and interpret the behaviors of others as if they possess goals, intents, and beliefs.

Dennett's philosophy is based on a distinction between the different stances that we can take towards a system. Dennett outlines three main stances we can take when, as scientists, we want to understand a system: the "physical stance" which interprets the system in terms of structural objects and physical relationships, the "design stance" which interprets the system in terms of functional objects, and the "intentional stance" which interprets the system in terms of intentional objects and relationships.

Dennett, attributing mental states—and, therefore, a mind—is an aspect of taking the intentional stance. For Dennett, the real meaning is not an intrinsic property of (say) someone's belief about the weather, is not really a property of that belief, but a property ascribed by others when they take the intentional stance to that person.

3.1.2 Brentano and Intentionality

Franz Brentano (1838-1917)(Douglas Burnham,2006), psychologist and philosopher, focused on the "intentionality"of mental states, by which he meant that thoughts are about their objects.

"Intentional" in Brentano's sense does not mean the same as "intentional" in ordinary language. An action is ordinarily intentional if it is done on purpose. We do not normally say that beliefs are intentional in this sense. But **intentions to act are intentional** in Brentano's sense. My intention is about doing something, for instance.

But **Brentano's puzzle** was the mind that can think about things that do not actually exist. (Intentional Inexistence).

Example:

You might *desire to see a unicorn* or *believe that you have seen a unicorn* even if there are none. Among physical phenomena, only things that actually exist can play a role. You cannot be trampled by a unicorn if there are none.

How then can intentionality be part of the physical world?

Brentano's challenge to materialism is that intentionality is a characteristic of mind that could never be explained in materialist terms. Thus, he took the **intentionality** of mental states to be **an argument for dualism.** The challenge to materialists is to show how to accommodate intentionality in the physical world. Because you are all so familiar with thinking about nonexistent things, you may not find Brentano's puzzle to be much of a puzzle initially. This is one of those cases where it is philosophy's job to overturn your unreflective prejudices. It really is a very odd fact about *thought* that you can think about things that don't exist!

Agreeing with Brentano's challenge to materialism, the NOHDLC model has been constructed in such a way, that intentionality and world existence coexist as a harmonized coexistence in which the actual world reality can be defined and understood.

3.1.3 Is Intentionality merely a Mental Content?

Beliefs are not merely patterns in the head -- they seem to be *about* things outside the head -- or as philosophers say, they have "content". Intentionality, in the technical sense introduced by Franz Brentano and understood by philosophers of mind, means *"aboutness"*(Douglas Burnham,2006).

Intentionality is very curious for a couple of reasons:

i) Beliefs can be about things that do not exist and may never exist (not everyone who dreams about having 3 beautiful children will have them). But how can something that doesn't even exist have any place in a causal/scientific view of the world?

ii) Beliefs can be in error. You can believe something false. But ordinary physical things aren't true or false...they just are.

Materialist theories of mind have to explain where intentionality comes from. Can intentionality be accommodated in a materialist framework?

To do so, one must show

- how content occurs (the "grounding" problem), and
- how content can be in error

This is a major area of current research in the philosophy of mind and philosophy of psychology. The major theories are too complicated to recount here, but the basic ideas are:

mental content is identified with causal-functional role or biological role, and

errors involve deviation from "normal" conditions.

Three major suggestions:

i) Functional Role

ii) Causal Covariance

iii) Appeal to biological functions

3.1.3.1 Functional Role Theories of Content