NATIONAL WORKSHOP ON LOGIC AND ARTIFICIAL INTELLIGENCE

Organised by

Calcutta Logic Circle
&
Centre for Cognitive Science, Jadavpur University

13 - 16 October 2003

Venue: Department of Pure Mathematics
University of Calcutta
35 Ballygunge Circular Road
Kolkata 700 019

	10.30 a.m.	11 -12 p.m.	12 – 1 p.m.	1 - 2 p.m.	2 – 3 p.m.	3 – 4 p.m.	4 – 5 p.m.
13 Oct `03	*Inaug*	A.C.	K.L.	P.P.	Lunch	P.P.	S.B.
14 Oct `03	10.30 – 11.30 a.m		11.30 – 12.30 p.m.	12.30 – 1.15 p.m.	1.15 – 2 p.m.	2 – 3 p.m.	3 -4 p.m.
	S.B.		K.L.	K.L.	Lunch	A.M.	A.S.
15 Oct `03	11 – 12 p.m.		12 – 1 p.m.	1 – 2 p.m.	2 – 3 p.m.	3 – 4 p.m.	4 -5 p.m.
	A.S.		A.M.	P.Pag.	Lunch	M.B.	S.S.
16 Oct `03	A.S.		A.M.	A.C.	Lunch	P.Pag.	M.B.

Speakers and their affiliations:

Amita Chatterjee (AC):	Department of Philosophy & Coordinator, Centre for Cognitive Science, Jadavpur University
Kamal Lodaya (KL):	The Institute of Mathematical Sciences, Chennai
Paritosh Pandya (PM):	Tata Institute of Fundamental Research, Mumbai
Somenath Biswas (SB):	IIT, Kanpur
Amitabha Mukherjee (AM):	IIT, Kanpur
Anil Seth (AS):	IIT, Kanpur
Piero Pagliani (PPag):	Rome
Mohua Banerjee (MB):	IIT, Kanpur
Smita Sirker (SS):	Centre for Cognitive Science, Jadavpur University

Speakers and Title of their Presentations:

Speaker: Amita Chatterjee

Title of presentation: *Artificial Intelligence: its philosophy and scope*

Speaker: Kamal Lodaya

Title of presentation: *Temporal logic interpreted as time points versus time intervals*

Abstract: Philosophers have long asked questions about the properties and structure of time, and logicians have developed temporal logics on point-based and interval-based views of time. In the early '80s, Johan van Benthem looked at how these views can be modelled by first-order structures, and how they can be related by model-theoretic machinery. This mathematical approach does not solve the problems of the philosophers or the logicians, but it provides a neutral ground in between.

Speaker: Paritosh Pandya

Title of presentation: *Specification Language*

Abstract: The talks will be an introduction to "Symbolic Model Checking" which is a technique to solve temporal logic questions about Kripke structures using the computer. I will show how many complex real-life situations in engineering are modelled as Kripke structures, how their properties are expressed in temporal logic and how the mathematical and computational techniques help in solving (verifying) these temporal logic specifications. I will have illustrations from working computer programs which implement the presented mathematics.

Speaker: Somenath Biswas

Title of presentation: *Universality in some complexity classes*

Abstract: Universality is an attempt to define structural properties which will guarantee a set to be complete in a class.

Speaker: Amitabha Mukherjee

Title of presentation: *Qualitative Algebras for Spatial Abstraction*

Abstract: The experience of space, as filtered by our consciousness, constitutes one of the earliest structures in our abstraction of this world, and there is strong evidence to indicate that some forms of spatial thinking underlie the human ability for conscious thought, and that it colours our experience of time and language. While space as it exists in the world is both infinite and infinitesimal, our minds can cope only with very limited models of this space, and efficient abstractions call for non-uniform models of the world, with finer discrimination at the "transition regions" or boundaries and less detail in regions of homogeneity. Based on this, a number of "qualitative" logics have

been developed focusing on aspects such as topology, orientation, extension and other aspects of spatial objects. We discuss several such models, including our own, and consider several computational issues relating to them. The last part of this talk presents some results that attempt to answer the symbol grounding question by binding symbols to spatial actions and visualizations.

Speaker: Anil Seth

Title of presentation: *X Calculus and Game Semantics*

Abstract: I will begin with an introduction to untyped lambda calculus and try to cover the proof that all recursive functions can be represented in it. I will introduce simply typed lambda calculus and present its game semantics and also attempt to cover a type system with applications in computer science.

Speaker: Mohua Banerjee

Title of presentation: *Para classical logics and non-monotonicity*

Abstract: There are logics that act as natural bridges between classical consequence and the principal kinds of non-monotonic logic. Like classical logic, they are monotonic but display some of the distinctive features of non-monotonic systems.

Speaker: Smita Sirker

Title of presentation: *The search for 'psychology of proof': two rival approaches*

Abstract: Research on human deductive reasoning pattern is a long drawn and a fascinating one. Broadly speaking, studies in this area of psychology of reasoning mainly follow two distinct trends: rule-based approach and ruleless approach. The main contention of these two theories centres on the question: do humans follow formal rules when they perform deductive tasks? As per the rule-based approach, people have a mental logic that requires a special logical structure, abstract specifications of rules, and discrete inferential steps that derive a conclusion from a limited set of premises. But, according to the ruleless approach, people do not follow such formal rules and they rely more on experience and the context in which reasoning takes place. The paper will highlight on two such rival theories and discuss their main points of contention.