Report on ICOT Visit

Robin Cooper
University of Edinburgh

1. Background

I have known about the work on Situation Theory and Situation Semantics at ICOT for some time from the published literature and was eager to learn more. I was therefore extremely interested when I met Mukai-san at a conference in Titisee, W. Germany and he suggested the possibility of this visit. It has been an extremely useful visit for me in that I have been able to obtain an overview of the natural language project and also discuss details on a number of matters. I have learned a good deal and hope that we have established some working relationships that will continue into the future.

2. Formal presentations and informal discussions

Various systems were either demonstrated or explained (or both) to me during my visit including DUALS, CIL, LAX, SAX, and the dictionary project. In addition to these natural language oriented systems I was also shown the CAL system.

I was also given an opportunity to make three presentations of my own work. I gave two formal lectures entitled "Situated information processing and parametric objects" and "Situation theoretic grammar: towards a computational view of linguistic theory". I also gave a somewhat less formal lecture entitled "Situations, Events and Discourse" to the JPSG group.

I was also involved in many useful and detailed discussions on a wide range of topics including: foundational aspects of situation theory and implications for computation, anaphora in general and in particular in Japanese, quantification in Japanese and in particular the problem of floated quantifiers, both theoretical and implementational aspects of CIL, the treatment of presupposition in situation semantics and its implementation in the problem solver component of DUALS, and details of morphological analysis used in LAX.

Thus we managed to cover a lot of ground during the two weeks I was at ICOT and I am grateful to all my ICOT colleagues for the stimulating discussions.

3. General Impressions

I was pleased to learn about the involvement of universities in the research supported by both government funds and funds from industry. This concentration of effort from the three sectors on a project which is central to both intellectual and industrial interests has been the object of much admiration and wonder by researchers in other countries where the coordination between these sectors is less well-organized and where industrial participation in long-term projects can be hard to achieve.

This concentration of effort has led to the development of some excellent underlying technologies at ICOT. Among those that are relevant to my own area I might note the results in parallel parsing by Matsumoto, Sugimura and other, the development of the language CIL by Mukai and others, and the constraint based approach which is being pursued with respect to a number of problems by Mukai, Sugimura, Hasida and others.

Another less tangible, though nevertheless important, result of this concentration of resources is the impressive training of an apparently large number of young researchers. I was surprised and happy to see that a large proportion of the researchers on the project are at an early stage in their career and I think that this should have an extremely beneficial effect on the continuation of this kind of work when these researchers return to their parent companies after their ICOT experience. I admire too the way in which ICOT has managed to pursue a coherent project of this length with the changeover in personnel. This cannot have been easy. It is particularly difficult in the area of natural language where there are still many opposing views and alternatives to be pursued.

For example, there may appear to be a conflict in that various grammatical formalisms are being developed side by side at ICOT: the formalism currently being used in DUALS, JPSG, and the constraint analysis of dependency structure. This is a natural situation to develop and in my opinion is to be encouraged. It seems to me that ICOT has the possibility, using CIL, of building a framework in which all could be encoded and compared. Such a framework would be following in the footsteps of PATR except that I believe it would be a richer system built on the foundation of logic programming on the one hand and situation theory on the other. I am pleased to see this kind of work going on side by side with detailed linguistic analysis of Japanese (for example, in the JPSG group) since I feel that such work should go hand in hand. In order to make a good linguistic toolbox one needs to have detailed linguistic analysis to test its facilities and in order to do detailed linguistic analysis in a computational setting one needs the kind of facilities to be found in the toolbox* .

A significant element that has made the natural language project cohere has been the decision to use situation semantics and the development of CIL, a language originally inspired by situation semantics. I am impressed and inspired by the way the ICOT project has used this theory in a number of computational settings and extracted insights about implementation from theoretical work on situation semantics. ICOT has done more than any other place in the world towards working out implementational details of this theory. It cannot be the case that a definitive computational version of situation semantics will have been developed in three years time, for the simple reason that the theory is still being developed by a number of different researchers in the world and we are only just beginning to understand the scope of possibilities for different variants of the theory. However, there is now a significant body of results in a number of different areas as is evidenced by the recent workshop on Situation Theory and Information Processing held in Edinburgh in September, 1988, and the conference on Situation Theory and its Applications to be held in Asilomar, Cal. in March, 1989 (both of which include presentations by members of ICOT). ICOT is contributing to this work by building a significant computational foundation for further research in the use of situation theory and situation semantics in computation. It will be a foundation that any significant work in this field will have to be measured against in the future.

The central aim of the natural language project seems to be to gain insight into the nature of discourse understanding and its implementation. What is desperately needed in this

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* Perhaps I might be permitted to make a rather trivial suggestion concerning the presentation of Japanese natural language systems to foreigners. It was a little difficult for me to get an impression of the linguistic coverage of the system in its present state. This is due in large part to the barrier that kanji characters create for the non-speaker or reader of Japanese. Even if the sentences are translated by the demonstrator it is quite difficult to recognize the characters corresponding to the words. I think a simple facility for romanizing the kanji display would be most helpful when displaying the system to linguists who know something about the structure of Japanese from the linguistic literature without knowing how to read the language. (Though, I must say, I am most impressed by and interested to learn about the amazing ability of Japanese computers to handle kanji characters!)

kind of research is a comprehensive foundational theory of information and communication - a theoretical breakthrough which will enable us to build the kind of discourse understanding system that we have failed to build in the past. ICOT's concentration on the development of situation theory and situation semantics shows a deep understanding of this need and I think further concentration on foundational concerns of situation theory and its implications for implementing systems which understand discourse will have the consequence that ICOT's contribution will be seen to be of fundamental importance in changing our view of how such systems should be constructed.

4. Acknowledgements

I would like to thank Dr Fuchi for inviting me to visit ICOT. Mr Iwata provided a very pleasant and helpful introduction to the project and organized the non-technical aspects of my trip in a gracious manner. Mr Kubo very kindly took care of me during my stay and was very conscientious in helping me to be at the right place at the right time. Dr Mukai first suggested this visit and has done much towards making it stimulating and enjoyable, both within the ICOT building and over many a shared meal. ICOT has an international reputation not only for its research but also for its hospitality. I would like to thank all of my colleagues in the second laboratory and indeed all the other members of ICOT I have met for a splendid series of parties and gatherings. Finally, I would like to thank whoever it was who made it possible for me to see Fuji-san in the sunset from the ICOT building.

CURRICULUM VITAE

Robin H. Cooper
Born: December 23rd, 1947, Shanklin, Isle of Wight, England

Education:
M.A., Corpus Christi College, Cambridge
Ph.D., University of Massachusetts at Amherst

Main Positions Held

1975-1976	Assistant Professor, Department of Linguistics, University of Texas at Austin.
1976-1977	Assistant Professor, Department of Linguistics, University of Massachusetts at Amherst.
1977-1981	Assistant Professor, Department of Linguistics, University of Wisconsin, Madison.
1981-1987	Associate Professor, Department of Linguistics, University of Wisconsin, Madison.
1984-1987	Docent, Department of Linguistics and Phonetics, Lund University.
1986- pres	Lecturer, Department of Artificial Intelligence and Centre for Cognitive Science, University of Edinburgh

Fellowships

1980-1981 Mellon Fellow in Linguistics and Philosophy, Stanford University

1981-1982 Fellow at the Center for Advanced Study in the Behavioral Sciences, Stanford

1986-1987 Guggenheim Fellow