

## 3. The Implementation of OSKAR

### 3.0 Introductory Remarks

In 1988, we began implementing the theory of dimensional designation as outlined in the previous sections. The result is the Prolog program OSKAR. Originally, the implementation was meant to be a means for testing the formal apparatus of the theory as to its **consistency** (no incorrect designations) and **completeness** (exhaustive applicability on spatial objects). To that end, both the theory and the program proved to be successful, which certainly is a welcome result in its own right. But what is more, in the course of developing OSKAR (by 'rapid prototyping') we were faced with some aspects of spatial knowledge which had not been taken into consideration before. These are, above all, rules and principles determining side assignment and positional variation. Moreover, they could be analyzed and integrated into the program very easily. Thus encouraged, we will present in this section the logical structure and the conceptual substance of OSKAR in some detail.

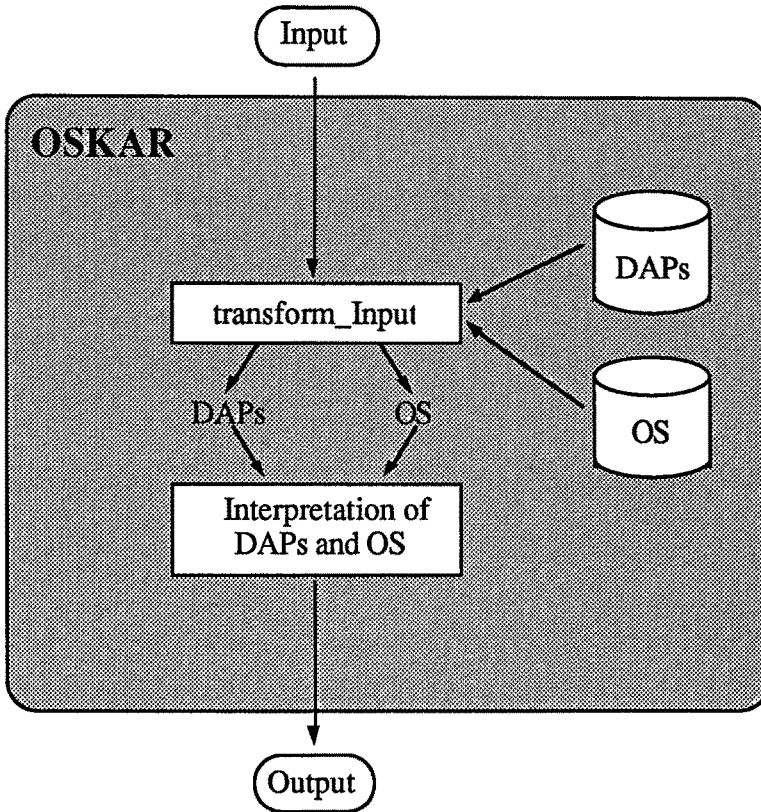
### 3.1 Outline of the Structure of OSKAR

As a first approximation, the structure of OSKAR comprises the following components:

- (a) Transformation of natural language Input into its semantic content (DAPs and OS) and
- (b) Interpretation of the DAPs with respect to the OS and display of the result as Output (see Fig. 10 below).

The Input to OSKAR can be any combination of an object name and one or more DAdjs, the latter being used either in attributive (*high tower, long and thick pole*) and/or predicative use (*Is a tower high?, A thick pole is long*). This natural language Input is transformed into intermediate structures in which adjectives and nouns are replaced by appropriately retrieved DAPs and OS, respectively. These structures, in turn, form the Input to the interpretation component of OSKAR, which is discussed in detail in section 3.3 below. Notice that this way of proceeding allows us to abstract from syntax, parsing and semantic construction and also from the gradation aspects of dimensional adjectives mentioned in section 2.1.3.

Fig. 10 The Components of OSKAR in Outline



The Output generated by OSKAR is determined by the success or the failure of the interpretation of the DAPs and the OS. In case of success, the actual dimensional assignments of the (possibly updated) OS and the object's current position properties are shown. Otherwise, an appropriate error message is delivered.

This simplified overall structure of OSKAR is reflected in the Prolog code shown in (48):

```
(48) oskar:-
    repeat,
    transform_input_to_DAPs_and_OS(DAPs_and_OS),
    interpretation_of_DAPs_and_OS(DAPs_and_OS),
    fail.

transform_input_to_DAPs_and_OS(DAPs_and_OS):-
    get_input(Input),
    transform_input_to_DAPs_and_OS(Input,DAPs_and_OS),!.
interpretation_of_DAPs_and_OS(DAPs_and_OS):-
    interpretation_of_DAPs_and_OS(DAPs_and_OS,Message),
    put_output(Message), !.
```