

## Structural System Property: *atis*StructuralProperties

(*Structural system properties* are those properties that are part of the theory and describe patterns of system and negasystem connectedness or partitions.)

### Structural Properties:

The structure of a system is defined by its affect relations.

Affect relations determine the structure of the system by the connectedness of the components.  $\mathcal{A}_1, \mathcal{A}_2, \dots, \mathcal{A}_n$  are the affect relation-sets of  $\mathcal{G}$ . These sets are elements of the family of affect relations,  $\mathcal{A}$ . These sets define each subsystem of  $\mathcal{G}$ .

For example, a *T/I-put interface system* will be defined as:  $T/I =_{df} T_P \cup I_P \cup S_P \cup \mathcal{L}$ , and is defined by the affect relations that define the feedin function,  $f_i$ , that results in the input resulting from a *System State-Transition* of toput into the system,  $\mathfrak{S}$ . For example, this subsystem may have three affect relations,  $\mathcal{A}_1, \mathcal{A}_2$ , and  $\mathcal{A}_3$ , that will generate the transition functions,  $f_i$ . That is:

$$f_{i(1)} \subset \mathcal{A}_1, f_{i(2)} \subset \mathcal{A}_2, \text{ and } f_{i(3)} \subset \mathcal{A}_3.$$

Then, the *System State-Transition Function*,  $\sigma$ , operating on the transition functions,  $f$ , “move” the qualified components from  $\mathfrak{S}'$  to  $\mathfrak{S}$  for each type of affect relation.

**Affect relation,  $\mathcal{A}$** ,  $=_{df}$

A connection of one or more components to one or more other components.

$$\mathcal{A} =_{df} \{ \{ \{ \mathbf{x} \}, \{ \mathbf{x}, \mathbf{y} \} \} \mid P(\mathbf{x}, \mathbf{y}) \wedge \mathbf{x}, \mathbf{y} \in \mathfrak{X} \subset \mathcal{G}_0 \vee [(\mathbf{x} = \mathcal{U} \subset \mathfrak{X} \subset \mathcal{G}_0 \wedge \mathbf{y} = \mathcal{V} \subset \mathfrak{Y} \subset \mathcal{G}_0)] \}$$

**Affect relations** define the connectedness of the system, and, therefore the system structure.

The following diagram depicts the structural properties as being the –put properties: toput, input, storeput, fromput, and output.

