
OLCD

OLCD = **Object Language with Complement** allowing
Descriptive cycles - derived from **ODL** [Bergamaschi, Nebel
Acquisition and Validation of Complex Object Database Schemata
Supporting Multiple Inheritance , Applied Intelligence, 4:185-203,1994]

Syntax

$$\begin{aligned} S \rightarrow & N \mid S_1 \sqcup S_2 \mid S_1 \sqcap S_2 \mid \neg S \\ & \mid \{S\}_{\forall} \mid \{S\}_{\exists} \mid [a_1 : S_1, \dots, a_k : S_k] \mid \Delta S \\ & \mid p \theta d \mid p \uparrow \end{aligned}$$

OLCD (cont.)

Semantics

$$\mathcal{I}[\top] = \mathcal{V}$$

$$\mathcal{I}[\perp] = \emptyset$$

$$\mathcal{I}[B] = \mathcal{I}_{\mathbf{B}}[B]$$

$$\mathcal{I}[\{S\}_{\forall}] = \{M \mid M \subseteq \mathcal{I}[S]\}$$

$$\mathcal{I}[\{S\}_{\exists}] = \{M \mid M \cap \mathcal{I}[S] \neq \emptyset\}$$

$$\mathcal{I}[[a_1 : S_1, \dots, a_p : S_p]] = \{t: \mathbf{A} \rightarrow \mathcal{V} \mid t(a_i) \in \mathcal{I}[S_i], 1 \leq i \leq p\}$$

$$\mathcal{I}[S_1 \sqcap S_2] = \mathcal{I}[S_1] \cap \mathcal{I}[S_2]$$

$$\mathcal{I}[S_1 \sqcup S_2] = \mathcal{I}[S_1] \cup \mathcal{I}[S_2]$$

$$\mathcal{I}[\neg S] = \mathcal{V} \setminus \mathcal{I}[S]$$

$$\mathcal{I}[\Delta S] = \{o \in \mathcal{O} \mid \delta(o) \in \mathcal{I}[S]\}$$

$$\mathcal{I}[(p \theta d)] = \{v \in \mathcal{V} \mid \mathcal{J}[p](v) \theta d\}$$

$$\mathcal{I}[(p \uparrow)] = \{v \in \mathcal{V} \mid v \notin \text{dom } \mathcal{J}[p]\}$$

[Beneventano, Bergamaschi, Lodi, Sartori
IEEE TKDE, 10,4:598-203,1998]