Computation Tree Logic

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Motivation

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Previously on Temporal Logic Week...

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Needing of uncertainty;

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Different paths of the future;

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Intuition

In Computation Tree Logic (CTL) the model of time is a tree-like structure. This way, we cannot use Linear Temporal Logic (LTL) to express the existence of a certain path of time in which some event occurs.

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Syntax

The syntax of CTL consists on the syntax of temporal logic plus some path operators. The class of formulas can be defined as goes. If ϕ is a formula:

$$\phi ::= \bot \mid \top \mid p \mid \neg\phi \mid \phi \wedge \phi \mid \phi \vee \phi \mid \phi \rightarrow \phi \mid \phi \leftrightarrow \phi \mid \mathtt{AX}\phi \mid \mathtt{EX}\phi \mid \mathtt{AF}\phi \mid$$

$$\mathtt{EF}\phi \mid \mathtt{AG}\phi \mid \mathtt{EG}\phi \mid \mathtt{A}[\phi \mathcal{U} \phi] \mid \mathtt{E}[\phi \mathcal{U} \phi]$$

With p as a literal, AX, EX, AF, EF, AG, EGoperadores unários.

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Semanthics