

Formal verification of UI using the power of a recent tool

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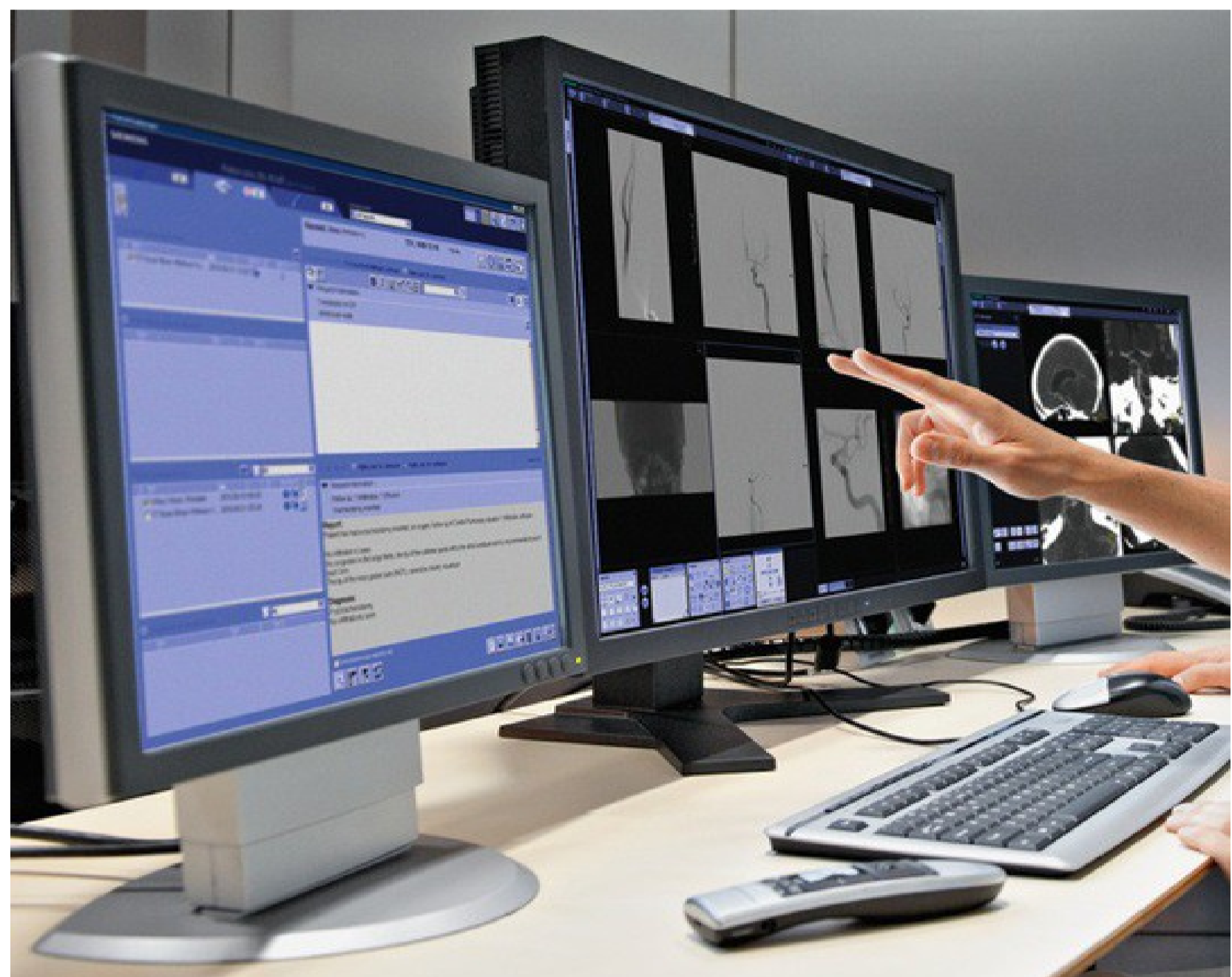
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Research context

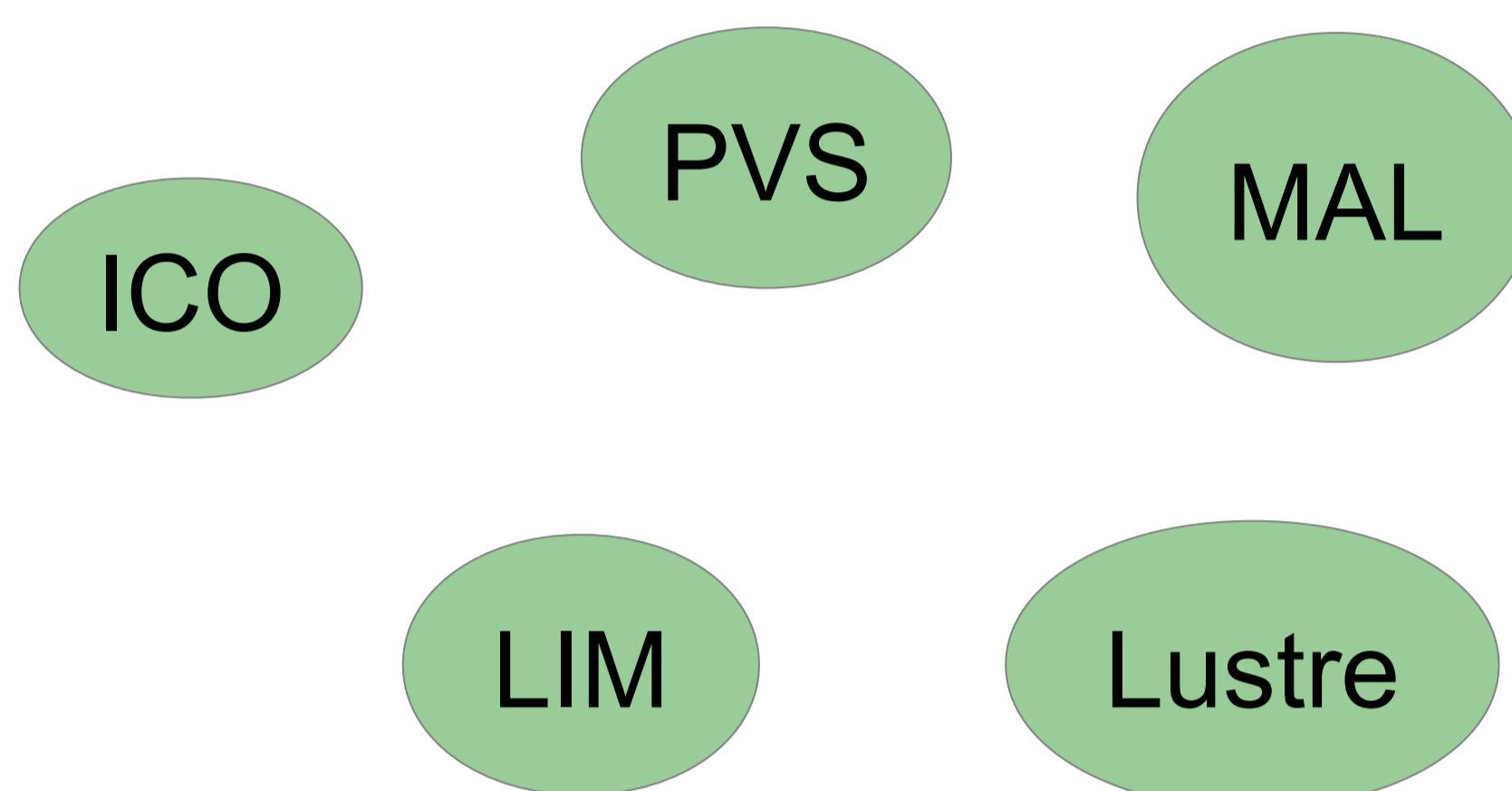
Topic



How to verify quality of user interfaces?

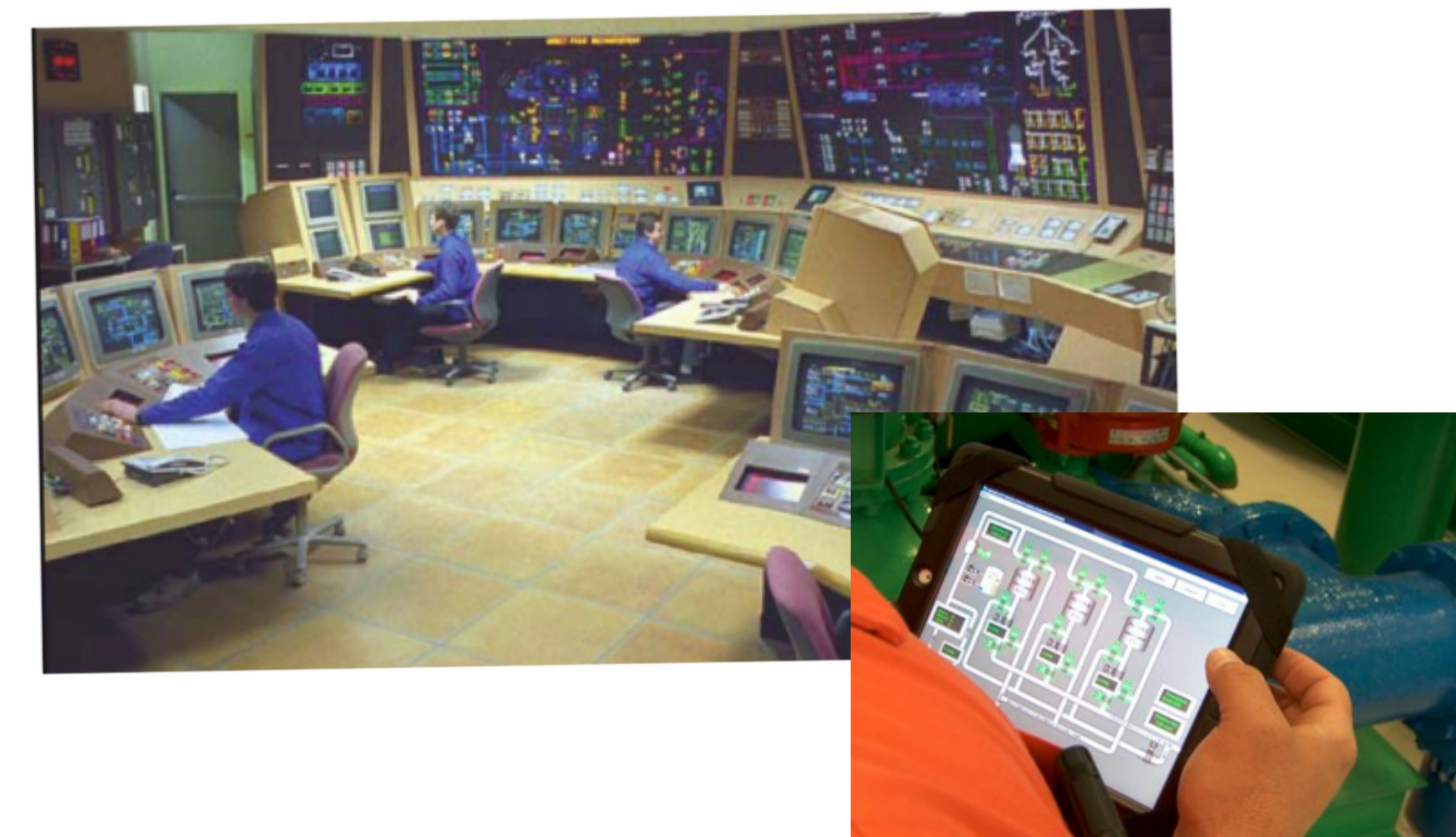
State of the art

- Testing
- Simulation
- Formal verification



Case Study

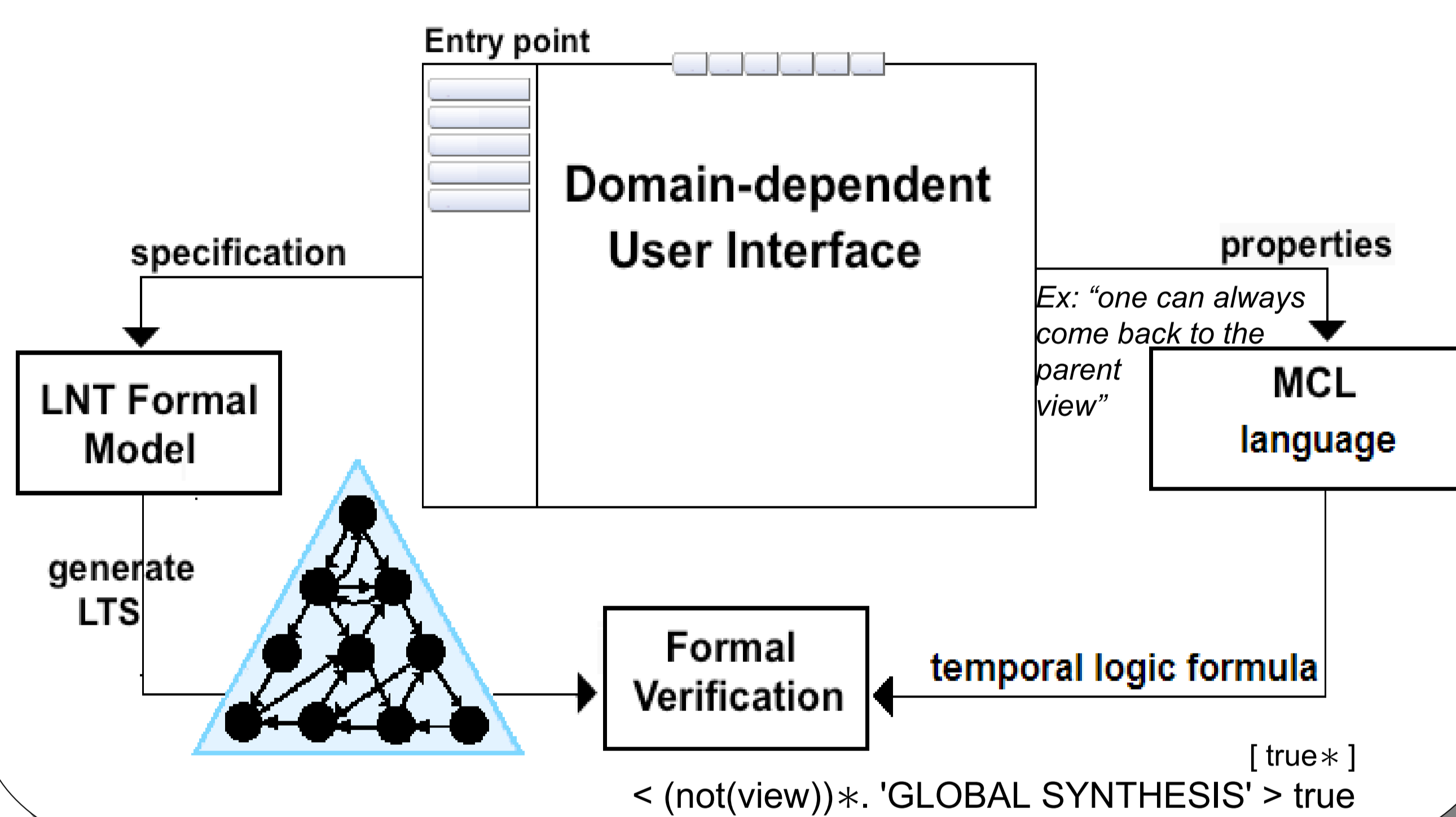
Nuclear power plant



Connexion
Contrôle-commande numérique pour le nucléaire

Formal verification of ergonomic properties

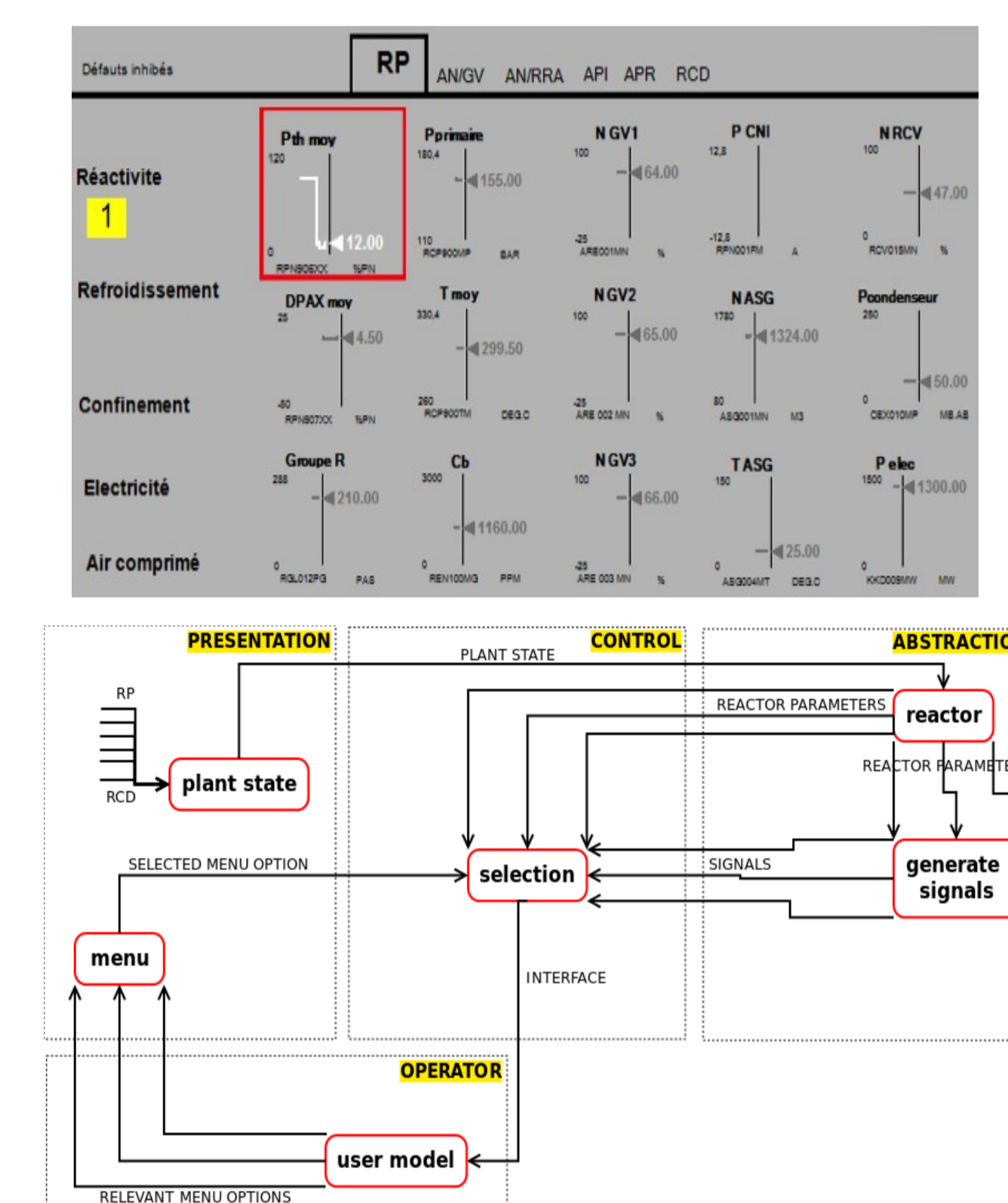
Approach



Innovations

- Support of recent tools (CADP 2014)
- Specialized toolbox
- User-friendly formal language (LNT)
- More powerful temporal logic (MCL)

LNT formal model



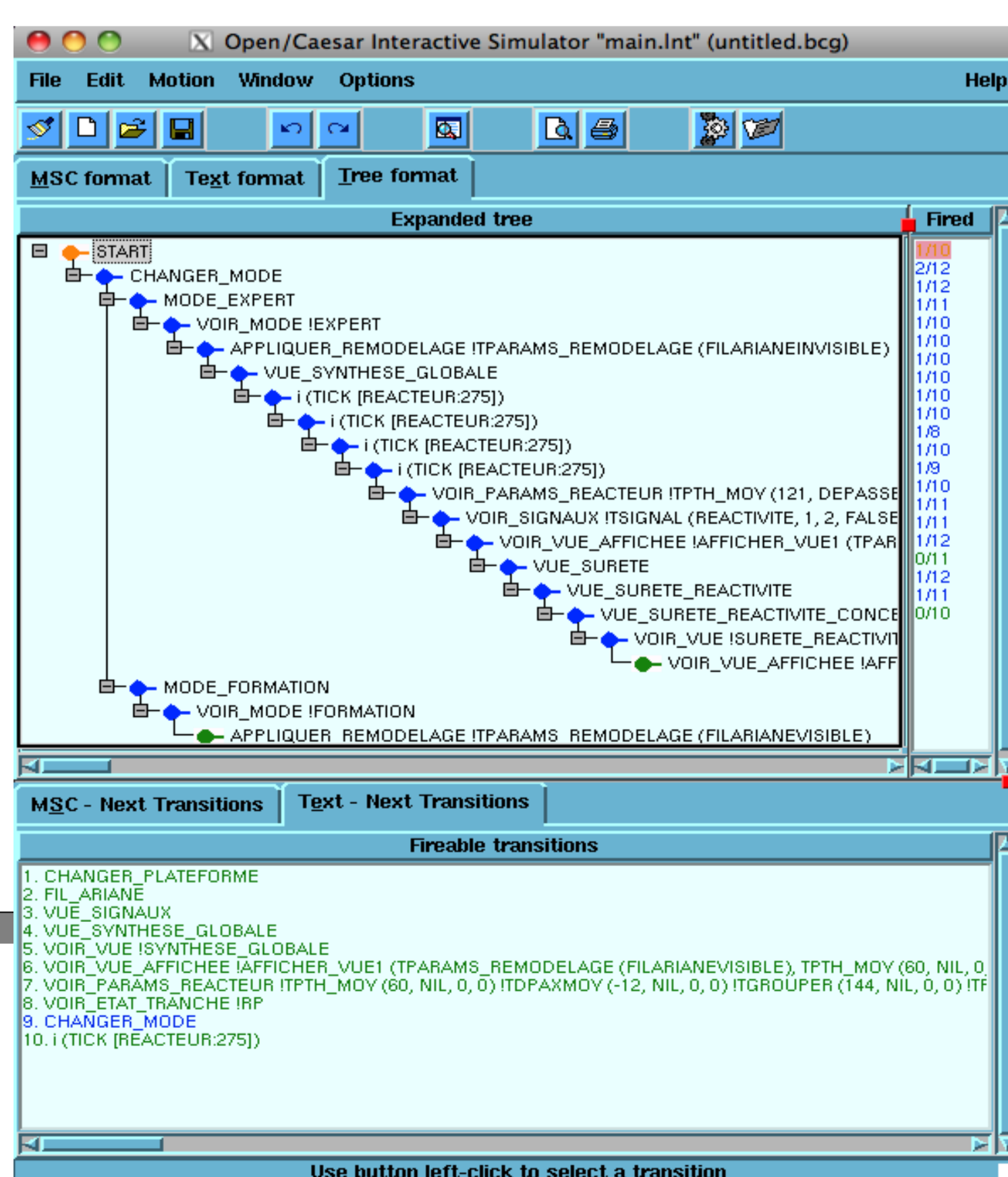
First results and perspectives

First results

Properties formalized in MCL:

- 1) from any view, one can always go directly to the main view (i.e. without passing through any other view)
- 2) a view is only accessible along the hierarchy of views
- 3) one can always come back to the parent view
- 4) the SIGNAL DETAILS view is always directly accessible
- 5) from any state one can always reach any view

Model of the user interfaces in LNT



Model checking and Simulation

Ongoing work

- Formalization of new properties
- Enhancement of the model realism

Perspectives

- Cover visual aspects of the UI (static)
- Enrich the model to consider adaptive Uis
- Cover equivalence checking
- Connect with the real user interface

