Initial Project Proposal

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Model Checking Input Language: Intro

The interest about the topic of Visual Programming paradigms arose when I was looking into new ways to specify formal models of systems for the model checking process. At the moment PROMELA is used as Spin's (model checker) input language. This is a textual programming language. However, to build models of systems is, in my opinion, easier and more intuitive using a visual programming language where you can view the entire system to be modelled.

Initial research

Research in this area is focused on constrained-based, data-flow, spreadsheet-based, imperative, logic, OO and rule-based paradigms. For concurrent paradigms there is "A Visual Environment for Designing and Simulating Execution of Processor Arrays" by C.D. Norton and E.P. Glinert. This is directed towards designing networks at an abstract level. However the focus of the research is towards concurrent processes and model checking input languages paradigms. Another reason to focus on model checking input languages is that they are considered under the non-deterministic paradigm.

Dependent Type Visual Programming: Intro

Another interesting area is researching the dependent types visual programming paradigm (Category Oriented Programming). The Luna project (`http://www.luna-lang.org/`) is still in development phase (alpha version still has to be released) and advancement into this area is open and makes it an interesting challenge to research into how to represent the type layer (on top of the "normal" language - kind of a meta language).

Conclusion

Personally I am more inclined to focus on the first project idea however I am also very interested in the possibilities and insights that the second project will offer. The two project ideas are at the moment general, later on I will focus on specific topics (like LTL model checking for the first project idea).