Fast Higher-order Term Rewriting for Model Checking Purposes

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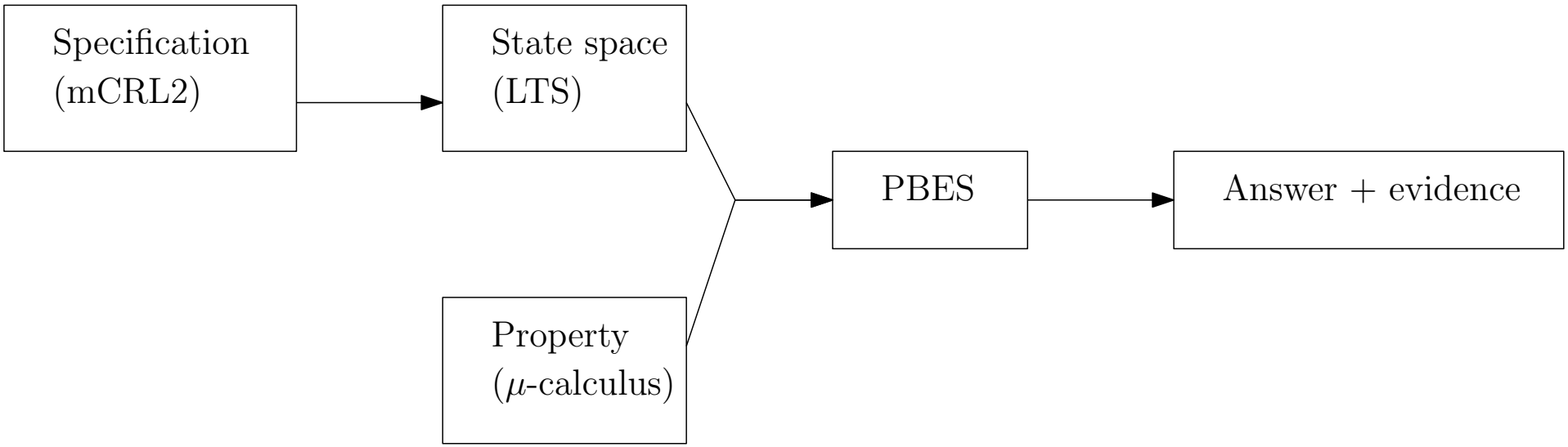
Model checking with the mCRL2 toolset



State space explosion

- LTS could contain many, many states
- A powerful rewriter is needed
- As of now, the choice of rewriter matters a lot performance-wise

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Rewrite rules?

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$c : \ell \to r$ with c of type $\mathbb{B}$ and ℓ first-order pattern.

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Rewrite step?

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Rewrite step? Application of a rule + β-reduction, both closed under contexts.
$C[t] \to_R C[r^\sigma]$ if there exists a substitution σ and a rewrite rule $c : \ell \to r$ such that $t = \ell^\sigma$ and $c^\sigma \to_R^* \text{true}$.
$C[(\lambda \vec{x}.t)(\vec{t})] \to_R C[t[\vec{x} := \vec{t}]]$

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- that has a clear documentation for users on the limitations of the formalism,
- that allows for optimisation.