Changes to RSL

A few changes have been made to RSL since the original book describing RSL (The RAISE Specification Language, Prentice-Hall, 1992):

- The expansion of explicit and implicit function definitions into signature and axiom has changed. The quantification in the axiom is over the given types of parameters rather than their maximal types. This approach is felt to be much more intuitive.

- The evaluation order of application expressions has been changed so that the function expression is evaluated before the parameters. This means that all evaluations in RSL are left-to-right.

- Axiom quantification (**forall**) is not used; axioms are quantified individually. This avoids counter-intuitive interpretations of axioms that did not mention all the names bound by the axiom quantification. This could be considered a stylistic restriction but is mentioned here as a reminder that **forall** should not be used. Similar remarks apply to $\forall$; care should be taken not to bind names not mentioned in the quantified expression.

- The rule that variables and channels from different objects are different has been extended to the actual parameters of schemes, so that the rule applies to formal parameters as well as objects defined within schemes or globally. This is a restriction on scheme instantiations and is necessary to ensure the compositionality of implementation.

- The map type constructor $\overrightarrow{m}$ has the new symbol $\overset{\sim}{\overrightarrow{m}}$. The original symbol has then been added to indicate the subtype of maps that have finite domains and are deterministic on application. That is, for any types *T1*, *T2*:

$$
\begin{array}{l}
\mathrm{T1}\ \overrightarrow{m}\ \mathrm{T2} \simeq \\
\quad \{|\ \mathrm{m} : \mathrm{T1}\ \overset{\sim}{\overrightarrow{m}}\ \mathrm{T2} \bullet \\
\qquad (\textbf{card dom}\ \mathrm{m}\ \textbf{post true}) \wedge \\
\qquad (\forall\ \mathrm{x} : \mathrm{T1} \bullet \mathrm{x} \in \textbf{dom}\ \mathrm{m} \Rightarrow (\mathrm{m}(\mathrm{x})\ \textbf{post true}))\ |\}
\end{array}
$$

  Thus there are now finite maps as well as finite sets and lists. In addition, application of such maps to arguments in their domains is deterministic.