Model Checking Quantum Robots

Suggestions for Formally Verifying Quantum Robots

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May 30, 2015

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Acknowledgment

Dott. Francesco Stefanni, University of Verona

Soon-to-be Dr. Prateek Tandon, who initiated the formation of this reading group on quantum robotics.

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Types of Mathematical Environments (1)

- A mathematical expression can be included within a line of text using either of the following ways.

- \begin{math} *formula_text* \end{math}: $\nabla \cdot \mathbf{E} = \frac{\rho}{\varepsilon_0}$

- \(*formula_text* \): $\nabla \cdot \mathbf{E} = \frac{\rho}{\varepsilon_0}$

- $ *formula_text* $: $\nabla \cdot \mathbf{E} = \frac{\rho}{\varepsilon_0}$

Types of Mathematical Environments (2): Mathematical expressions that is separate from the main text

- To include mathematical expressions without sequential equation numbers:
  - \begin{displaymath} *formula_text* \end{displaymath}:

$$\nabla \times \mathbf{B} = \mu_0(\mathbf{J} + \varepsilon_0 \frac{\partial \mathbf{E}}{\partial t})$$

  - $$ *formula_text* $$:

$$\nabla \times \mathbf{B} = \mu_0(\mathbf{J} + \varepsilon_0 \frac{\partial \mathbf{E}}{\partial t})$$

- To include mathematical expressions with sequential equation numbers: \begin{equation}\label{eqn:default} *formula_text* \end{equation}

$$\nabla \times \mathbf{B} = \mu_0(\mathbf{J} + \varepsilon_0 \frac{\partial \mathbf{E}}{\partial t}) \quad (1)$$

Cross Referencing Equations, Tables, and Figures.

This refers to Equation 1, while this refers to the random figure, Figure 2. I am referring to Equations 2.

I am referring to Table 1.

Elements of Math Mode

- Mathematical Symbols: \$+, -, =, <, >, /, |, [,]\$
- Exponents (superscript) and indices (subscript):
  - \$x^{2}\$ typesets into x^2
  - \$x_{2}\$ typesets into x_2
- Fractions: \frac{*numerator*}{*denominator*}, $\frac{1}{2}$
- Roots: \sqrt{root}{argument}. E.g., $\sqrt[3]{8}$
- Continuation dots, ellipsis: \dots, $\dots$; \cdots, $\cdots$; \vdots, $\vdots$; and \ddots, $\ddots$.

Mathematical Symbols

- Greek symbols: \alpha, α
- Calligraphy letters: \mathcal{A}, $\mathcal{A}$
- Binary operators: \pm, $\pm$
- Relations: \ll, $\ll$
- Arrows and pointers: \Longrightarrow, $\Longrightarrow$
- A comprehensive list of mathematical symbols can be found at [**?**].

Greek Symbols

Figure: List of Greek symbols that can be typeset in LaTeX

Some Typesetting Tips

- Automatically adjust brackets and braces with the \left and \right commands before the brackets and braces.
- E.g., \left[\frac{1}{2} \right] $\left[\frac{1}{2} \right]$
- \begin{equation}
  f(n) = \begin{cases}
  case-1 &: n is odd
  case-2 &: n is even
  \end{cases}
  \end{equation}
- $$f(n) = \begin{cases} case-1 & : \text{n is odd} \\ case-2 & : \text{n is even} \end{cases} \quad (2)$$

Set of Equations

```
\begin{gather}
\text{minimize } BLAH
\underline{x} \in S
\text{subject to:}
\end{gather}
```

$$\begin{gathered}
\text{minimize } f = a \cdot x^2 + b \cdot x^5 \\
\underline{x} \in S \\
\text{subject to :} \\
x - y < 6 \\
x + z > 7
\end{gathered}$$

Matrices

```
\left (\begin{array}{ccc}1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1
\end{array} \right)
```

$$\left (\begin{array}{ccc}1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{array} \right)$$

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Typesetting Tables in LaTeX Documents (1)

```
\begin{table}[htdp]
\caption{default} \label{tab:default}
\begin{center}
\begin{tabular}{|c|c|c|c|}
\hline
Level & Use & Features & Abstraction \\
\hline
Level & Use & Features & Abstraction \\
\hline
Level & Use & Features & Abstraction \\
\hline
\end{tabular}
\end{center}
\end{table}
```

Typesetting Tables in LaTeX Documents (2)

Table: A simple table that is typeset in LaTeX.

Level	Use	Features	Abstraction
Level	Use	Features	Abstraction
Level	Use	Features	Abstraction

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Including Graphics in LaTeX Documents (1)

```
\begin{figure}[h]
\centering
\includegraphics[width=6in]{ – INSERT FILENAME OF FIGURE}
\caption{INSERT CAPTION HERE}
\label{fig:INSERT LABEL OF FIGURE}
\end{figure}
```

Including Graphics in LaTeX Documents (2)

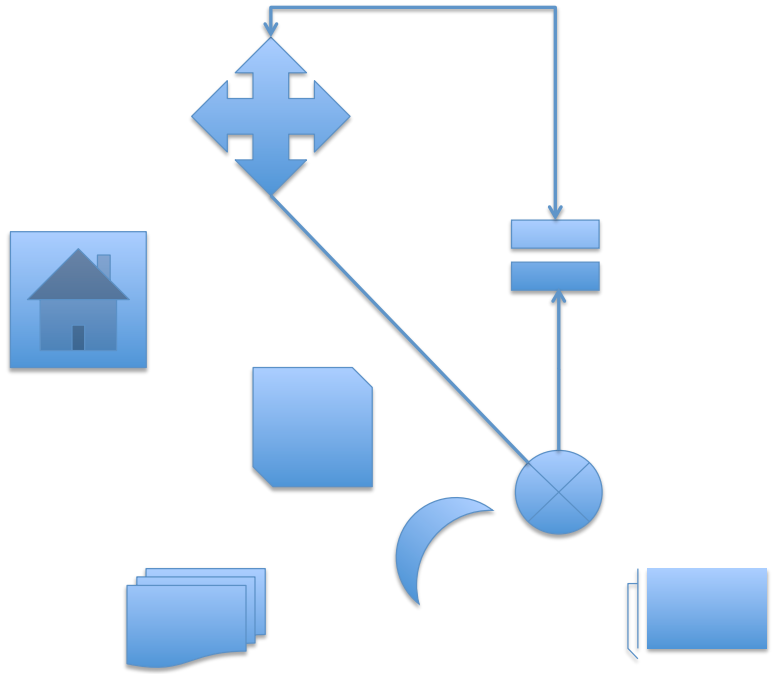

Figure: A random figure.

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References