LaTex Output from IK-BT Package

Blake Hannaford, Dianmu Zhang
University of Washington
July 2017

1 Introduction

The IK-BT package generates a report on your inverse kinematics solution automatically. This produces an output that can be much easier to read and check. The Latex output consists of two parts:

1. `ik_report_template.tex` — the template document containing overall setup and formatting information,
2. `IK_solution_NAME.tex` — the specific solution equations produced for your robot (where `NAME` is your robot's name),
3. `IK_solution.tex` — a copy of the most recently solved `IK_solution_NAME.tex`.

2 How to use

To produce your readable output, just enter

```
> pdflatex ik_report_template.tex
```

The template will automatically include your most recent solution (`\input{IK_solution.tex}`). `IK_solution_NAME.tex` is kept so that solving a new robot does not clobber your old work.

Your output will then appear as `ik_report_template.pdf` . The package produces the following output sections in the Latex file:

1. Introduction
2. Kinematic Parameters: Lists your DH parameters for reference and error checking.
3. Forward Kinematic Equations: These are the automatically computed FK equations that are actually solved.
4. Unknown Variables: Lists the unknows in solution order.
5. Solutions: The equations for all solutions for each variable.
6. Solution Branching graph: A graph illustrating the dependencies between solutions (but so far this is only in text form).

7. Solution Sets: The valid solutions (e.g. manipulator poses) for a given end effector configuration (T_6^0) are listed here.

Sometimes the equations or the graph can be too long and extend beyond the right side margin. In this case you need to go into the `IK_solution.tex` file and make appropriate edits to break up the equations onto separate lines. Suggestions are provided in the report.

3 LaTex

If you are not familiar with LaTex, you can install it in your system, or mouse the latex content into an online tool such as `https://www.overleaf.com`.

Debian Based Linux: > apt-get -y install texlive

Other OS: `https://www.latex-project.org/get/`