Additional instructions for reports in the Computational Dynamics group

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Introduction

This LaTeXfile gives additional instructions how we expects students to write thier report within the Computational Dynamics group. It is an extension on the Dynamics & Control template. Herein, we give help on

- writing down equations and using the provided commands,

- making mechanical drawings in inkscape,

- exporting simulation results (from cardillo),

- creating figures with pgf plots.

1 Writing equations and usefull commands

Extending the nomenclature of the template, we use lowercase letters to indicate scalar variables, i.e., $c \in \mathbb{R}$, bold lowercase letters to indicate vector quantities, i.e., $\boldsymbol{v} \in \mathbb{R}^3$ and bold uppercase letters to indicate matrix quantites, i.e., $\boldsymbol{A} \in \mathbb{R}^{3 \times 3}$. Since these are very common in mechanical reports, the file **header.tex** contains a lot of usefull commands to write down these bold characters by writing \vv or \vA in these example. Also bold greek letters are included with a similar structure to make writing down equations even more simple. We can write for example

$$\boldsymbol{\gamma} = \dot{\boldsymbol{g}} \quad \text{and} \quad \boldsymbol{\Lambda} = \int \boldsymbol{\lambda} \mathrm{d}t \,. \tag{1}$$

Also have a look at the other commands, allowing you to write calligraphic and fracture letters if needed.

During the process of writing the report, you might indicate some changes in the text, or you want to put down a placeholder or a question directly. You can do so by using \correctb, \correctr, \correcto, **To-Do:** \todo and **Question:** \question .
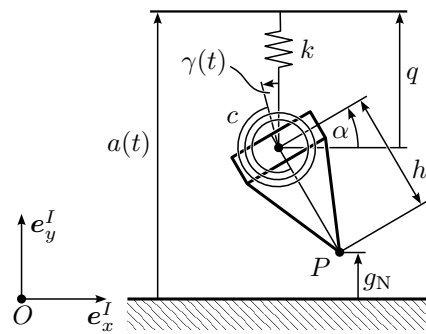
2 Drawing in inkscape

Lines

To-Do: Stolen from INM template

- Very thick 0.6 mm

- thick 0.4 mm

- thin 0.2 mm

- very thin 0.1 mm

- tip of an arrow: 15°

One should mainly use thick and thin

Mechanical models

- thick (0.4 mm): Body contours, forces and moments

- thin (0.2 mm): Coordinate systems, geometric measurements, hatching, guide lines, springs, dampers, gravitational acceleration

Computed lines

- Coordinate systems: 0.2 mm

- additional measurements: 0.2 mm

- individual functions: 0.4 mm

- sets of functions: 0.2 mm, to highlight individual ones: 0.4 mm

- coordinate grid: 0.1 mm (if neccessary)

2.1 Adding text on drawings

To finish the drawing,