Robotics Challenge 2015

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Abstract

Brief description of the content (5-10 lines). Helps people decide whether the report is relevant for them or not. Usually written at the end.

Keywords. add, keywords, for, indexing

Prologue

This document is a LaTeX template for the Robotics Challenge. Even though it is mandatory to use LaTeX for this report, the template can be chosen individually. There are other templates available from the (Association for Computer Machinery) ACM[1] (Association for Computer Machinery) and from the IEEE[2] (Institute of Electrical and Electronics Engineers). Note that those templates are well documented and worth considering for this report.

Characteristics of a technical report

The goal of a technical report is to transfer the authors knowledge. This requires that the report is written in an objective and informative style, which must also be reflected in the structure. Starting with the big picture in the abstract, the report gets more and more detailed, guiding the reader along the way. Once everything is discussed in detail and the results are validated, the content is finally synthesized.
An important part of scientific writing is citing all external sources in a clear, unambiguous manner. Failing to do so is called plagiarism. It is not only unethical, it will most likely result in sanctions.
A huge literature exists about scientific writing. A good entry is given by [1].

Introduction

Objectives of this project and brief description of the problem at hand, the achieved solution and results.

1 Problem statement

Description of the challenge and the environment (e-puck robots, ASEBA suite, and lab).

[1] See https://www.acm.org/sigs/publications/proceedings-templates.
[2] See http://www.ieee.org/conferences_events/conferences/publishing/templates.html.

2 Solution Strategy

Description of the approach chosen to solve the challenge.

3 Implementation

Description of how the solution strategy in Section 2 was implemented. Only short excerpts of code or pseudo code should be used here. Longer excerpts can be included in Appendix B.

4 Validation

Description of how the solution turned out and what problems were encountered. Since this report is accompanied by a short video, it can be referenced to illustrate the result.

Conclusion

Synthesis of the paper and outlook for further work.

Personal Comments

Feedback to the course and project (what you liked, what you didn't like, what you learned, ...).

References

[1] Justin Zobel. *Writing for Computer Science*, 2nd edition. Springer-Verlag, London, 2004, 275 pages.

[2] Valentino Braitenberg. *Vehicles: Experiments in Synthetic Psychology*. MIT Press, 1986.

[3] *Aseba User Manual*. https://aseba.wikidot.com/en:asebausermanual. Last visited: 29.04.15.

Appendix A Experimental Results

Place to list the gathered data.

Appendix B Source Code

Place to list source code.

B.1 Advanced Love Behavior

The code below shows an e-puck implementing the advanced love behavior.

```
<!--node e-puck 2-->
<node nodeId="2" name="e-puck 2">
#-----------------------------------------------------------
# Advanced love behaviour
#-----------------------------------------------------------
var proxRight
var proxLeft
var ds   # delta speed

onevent ir_sensors
    # proximity
    proxRight = (prox[0] + 3*prox[1] + prox[2])/5
    proxLeft = (prox[7] + 3*prox[6] + prox[5])/5

    # check which side is closer to obstacle
    if proxRight > proxLeft then # turn left
        # delta speed ds
        call math.muldiv(ds, S_INIT, proxRight, P_THRESH)
        # right and left speed
        speed.right = ds
        speed.left = S_INIT - ds
    else # turn right
        # delta speed ds
        call math.muldiv(ds, S_INIT, proxLeft, P_THRESH)
        # right and left speed
        speed.right = S_INIT - ds
        speed.left = ds
    end
</node>
```

B.2 Explore Behavior

The code below shows an e-puck implementing the explore behavior.

```
<!--node e-puck 3-->
<node nodeId="3" name="e-puck 3">
#-----------------------------------------------------------
# Explore behaviour
#-----------------------------------------------------------
var proxRight
var proxLeft
var ds   # delta speed

onevent ir_sensors
    # proximity
    proxRight = (4*prox[0] + 2*prox[1] + prox[2])/7
    proxLeft = (4*prox[7] + 2*prox[6] + prox[5])/7

    # check which side is closer to obstacle
    if proxRight > proxLeft then # turn left
        # delta speed ds
        call math.muldiv(ds, S_INIT, proxRight, P_THRESH)
        # right and left speed
        speed.right = S_INIT + ds
        speed.left = S_INIT - ds
    else # turn right
        # delta speed ds
        call math.muldiv(ds, S_INIT, proxLeft, P_THRESH)
        # right and left speed
        speed.right = S_INIT - ds
        speed.left = S_INIT + ds
    end
</node>
```

Appendix C LaTeX Examples

This section shows some common uses of LaTeX features.

C.1 Images

Example of how to include an image can be seen in Figure 1. All figures must be referenced somewhere in the report.

C.2 Tables

Example of how to include a table can be seen in Figure 2. All figures must be referenced somewhere in the report.

Figure 1: Including an image.

Title 1	Title 2
item 11	item 12
item 21	item 22

Figure 2: Table with caption.

C.3 Listings

Example of how to include listing can be seen in Figure 3 and Figure 4. All figures must be referenced somewhere in the report.

C.4 Font Style and Text Size

The font style may be modified: **bold**, *italic*, *Emphasis*, CAPITALS, `verbatim`, etc.

The text size can be changed: tiny, small, large, huge, etc.

C.5 Enumerations and Other Lists

Enumerations are easy, there is the `enumerate` environment:

1. First item
2. Second item

```
1 <!--list of constants-->
2 <constant value="1500" name="P_THRESH"/>
3 <constant value="600" name="S_INIT"/>
```

Figure 3: Listing included from file.

```
1 var v [3]
2 onevent ir_sensors
3     ground.get_values(v)
```

Figure 4: Listing within LaTeX.

3. Third item

For lists, there is the `itemize` environment:

- First item
- Second item
- Third item

For definitions lists, there is the `description` environment:

First term – Description of the first term

Second term – Description of the second term

C.6 Quotations and References

Books and other documentation can be referenced as [2] and websites as [3].