Supporting Robotic Deliberation:
The Deliberation Working Group and Tools for Behavior Trees

Christian Henkel, Bosch Research

ROSCon 2023

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"The education of a computer" 1952
Grace Murray Hopper, Remington Rand Corp

1000 " stopped - arctan ✓ 9.037 846 995 correct

13"sec (032) MP - MC ~~1.9826442000~~ ~~2.130476415 (-3)~~ 4.615925059 (-2)

(033) PRO 2 2.130476415

correct 2.130676415

Relays 6-2 in 033 failed special speed test

in Relay " 11.00 test.

Relays changed

1700 Started Cosine Tape (Sine check)

1525 Started Mult + Adder Test.

1545

Relay #70 Panel F

(moth) in relay.

First actual case of bug being found.

~~1703~~ 1630 Arctangent started.

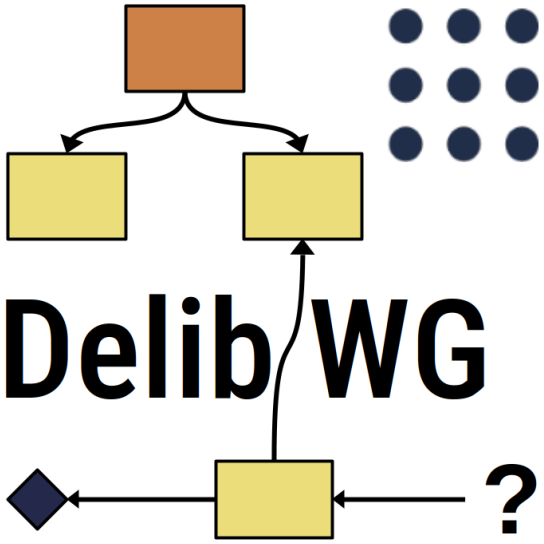
1700 closed down.

Relay 2145

Relay 337

1

Deliberation Working Group



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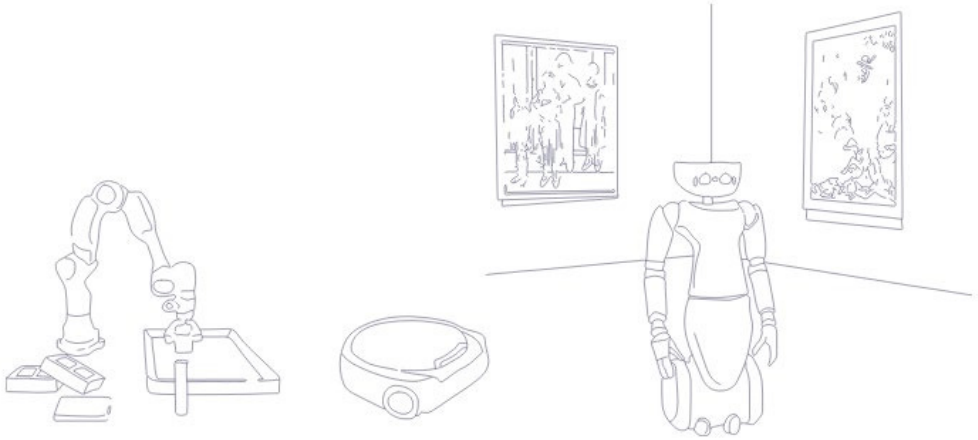
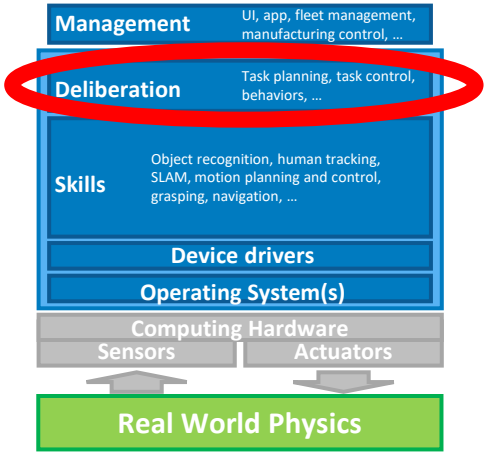
Convince Project

convince-project.eu



CONVINCE

Funded by
the European Union



Partners

ISTITUTO ITALIANO DI TECNOLOGIA
Università di Genova
UNIVERSITY OF BIRMINGHAM
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CITTÀ DI TORINO
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Engineering Innovation Automation
TIMELEX

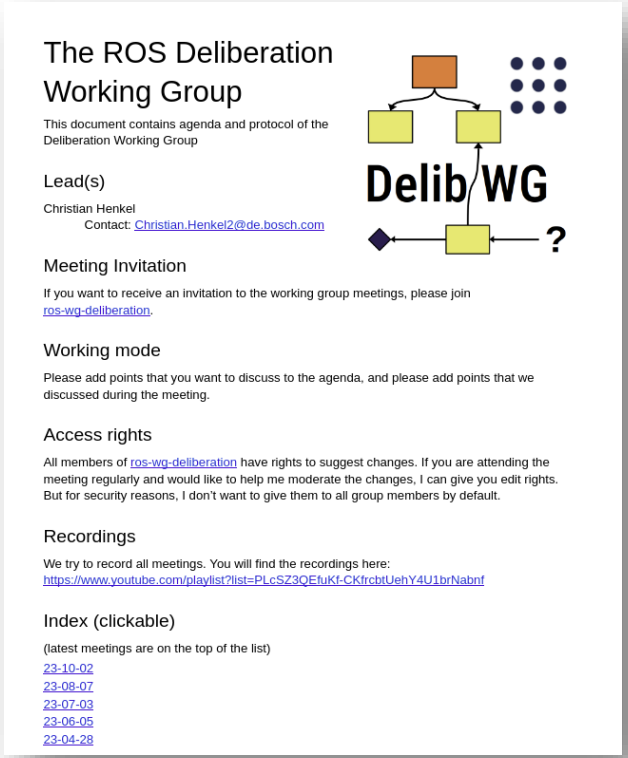
Deliberation Working Group
Welcome Page

https://bit.ly/delibwg

Networking and knowledge exchange

Discussion of novel and advanced works on top of the state of the art

Streamlining & harmonization of common interfaces



The ROS Deliberation Working Group

This document contains agenda and protocol of the Deliberation Working Group

Lead(s)

Christian Henkel
Contact: Christian.Henkel2@de.bosch.com

Meeting Invitation

If you want to receive an invitation to the working group meetings, please join ros-wg-deliberation.

Working mode

Please add points that you want to discuss to the agenda, and please add points that we discussed during the meeting.

Access rights

All members of ros-wg-deliberation have rights to suggest changes. If you are attending the meeting regularly and would like to help me moderate the changes, I can give you edit rights. But for security reasons, I don't want to give them to all group members by default.

Recordings

We try to record all meetings. You will find the recordings here:
https://www.youtube.com/playlist?list=PLcSZ3QEfuKf-CKfrcbtUehY4U1brNabnf

Index (clickable)

(latest meetings are on the top of the list)

23-10-02
23-08-07
23-07-03
23-06-05
23-04-28

More information

- To participate: https://groups.google.com/g/ros-wg-deliberation
- Recordings: https://www.youtube.com/playlist?list=PLcSZ3QEfuKf-CKfrcbtUehY4U1brNabnf

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Deliberation Working Group
Technologies Word Cloud

https://bit.ly/delibwg

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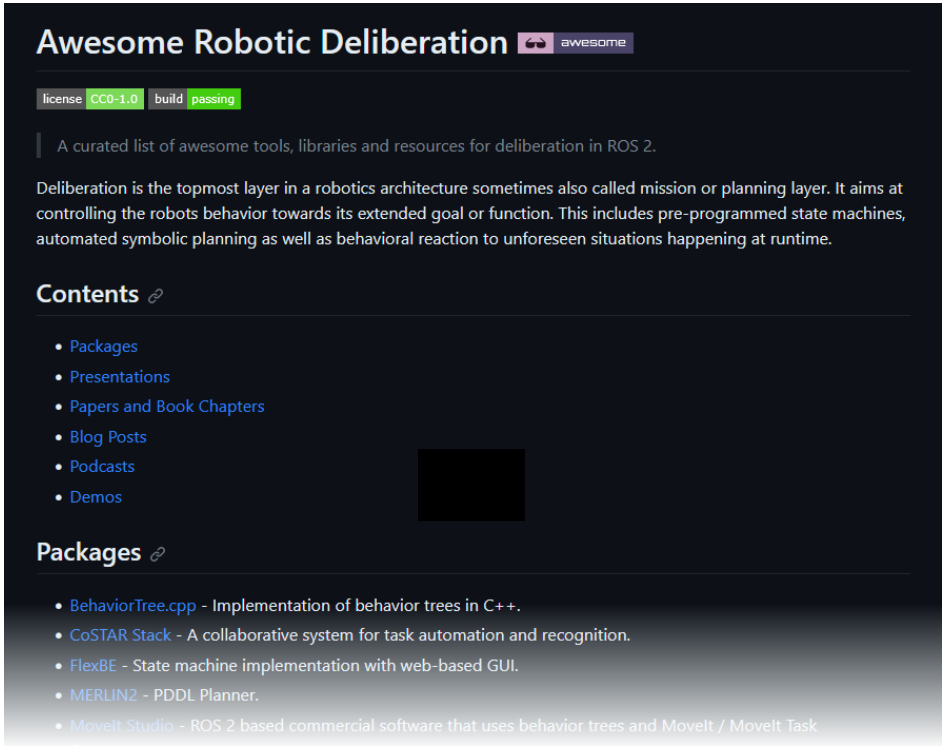
Working Group
Our first product: Awesome Deliberation

https://bit.ly/delibwg

- Our first Product is a list of robotics deliberation
  - Packages
  - Presentations
  - Publications
- Feel free to contribute:
  - https://github.com/ros-wg-delib/awesome-ros-deliberation
- Next steps
  - **Standardization of behavior tree nodes**



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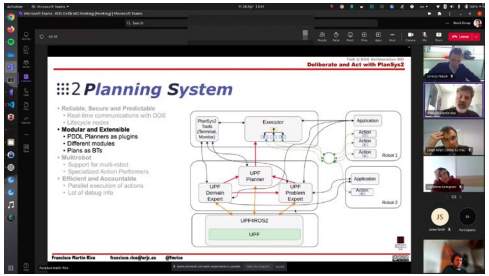
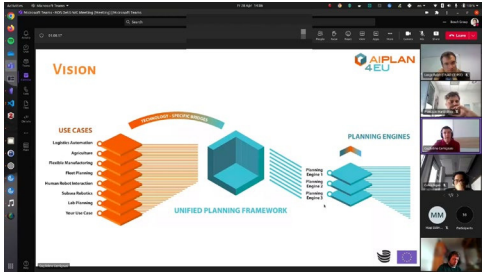
Some Presentations

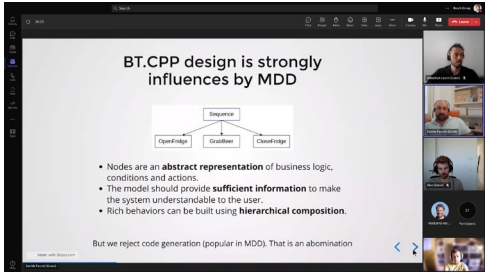
Deliberate and Act with PlanSys2, Francisco Martín Rico, Universidad Rey Juan Carlos



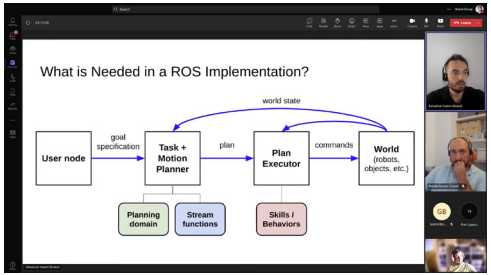
AIPlan4EU and Planning with Behavior Trees, Guglielmo Gemignani, Magazino GmbH



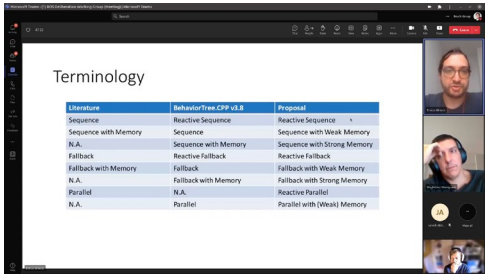
BehaviorTree.CPP: what makes it different from other implementations, Davide Faconti



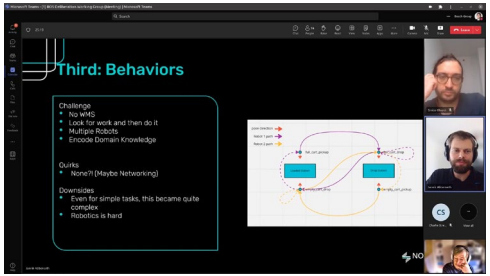
Integrated Task and Motion Planning with ROS 2 and PDDLStream, Sebastian Castro



Different behavior tree formalisms, Enrico Ghiorzi, Università di Genova



Deliberation at NODE - Quirks and Features, Jannik Abbenseth, NODE Robotics



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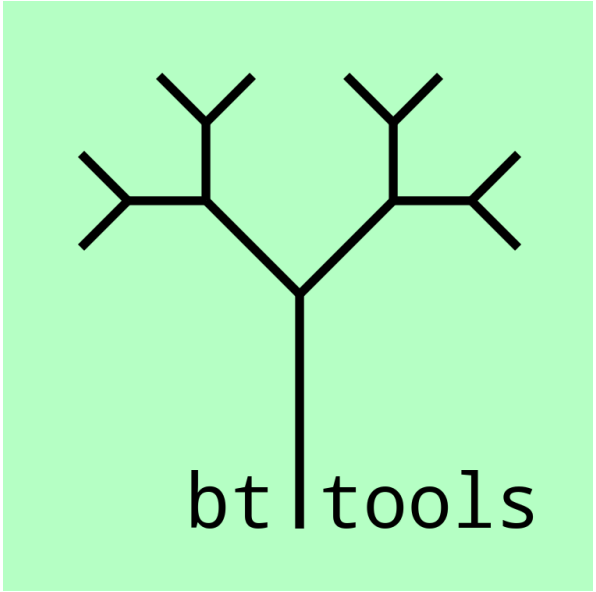
2

Tooling for Behavior Trees



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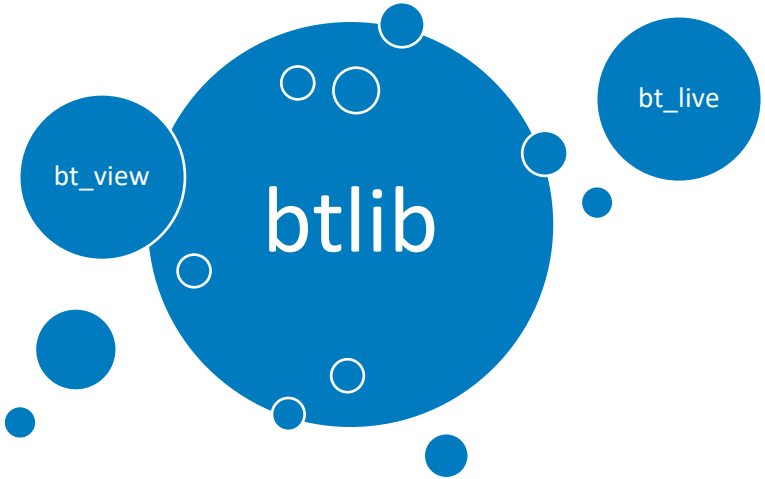
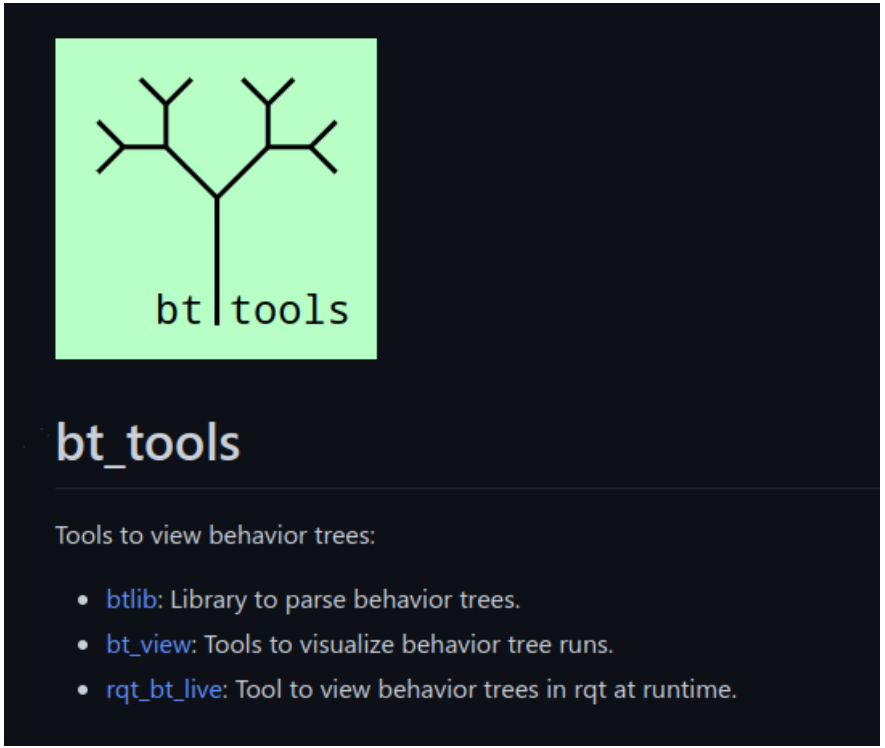
Tooling for Behavior Trees
A toolkit for the Behavior Tree Tender

https://github.com/boschresearch/bt_tools

bt_tools

A *python* library and multiple tools to visualize and analyze behavior trees created with **behaviortree.cpp**





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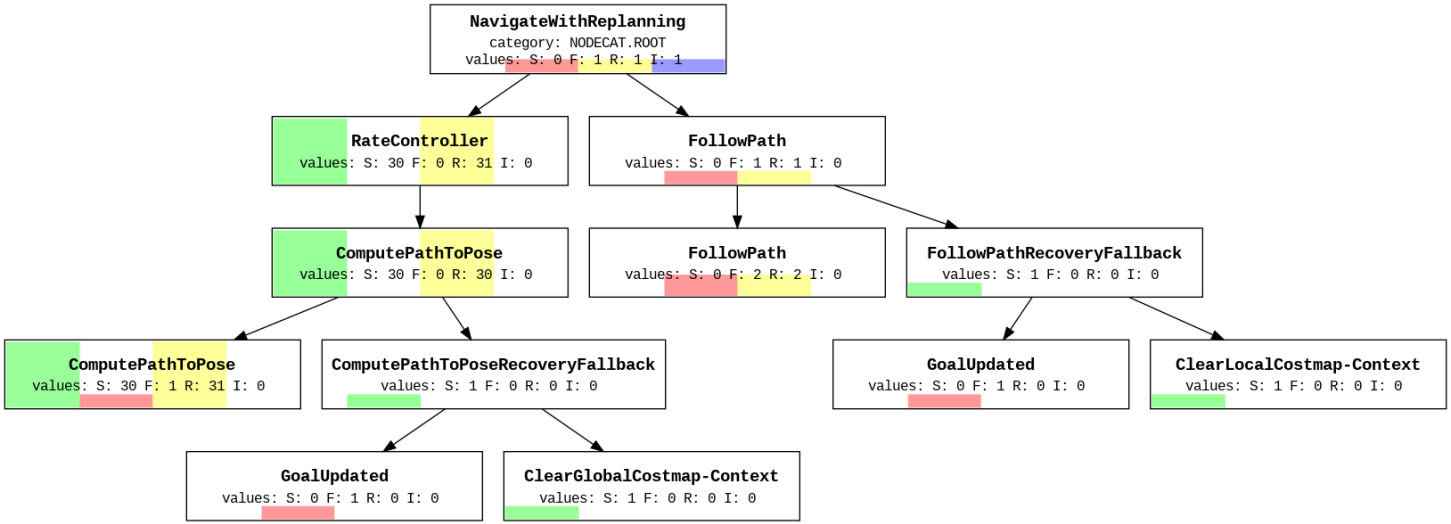
Tooling for Behavior Trees
Offline analysis: **bt_view**

https://github.com/boschresearch/bt_tools




```
ros2 run bt_view bt_view --
bt_log_fbl_fnames <path_to_fbl_log> --
coverage-threshold <threshold>
```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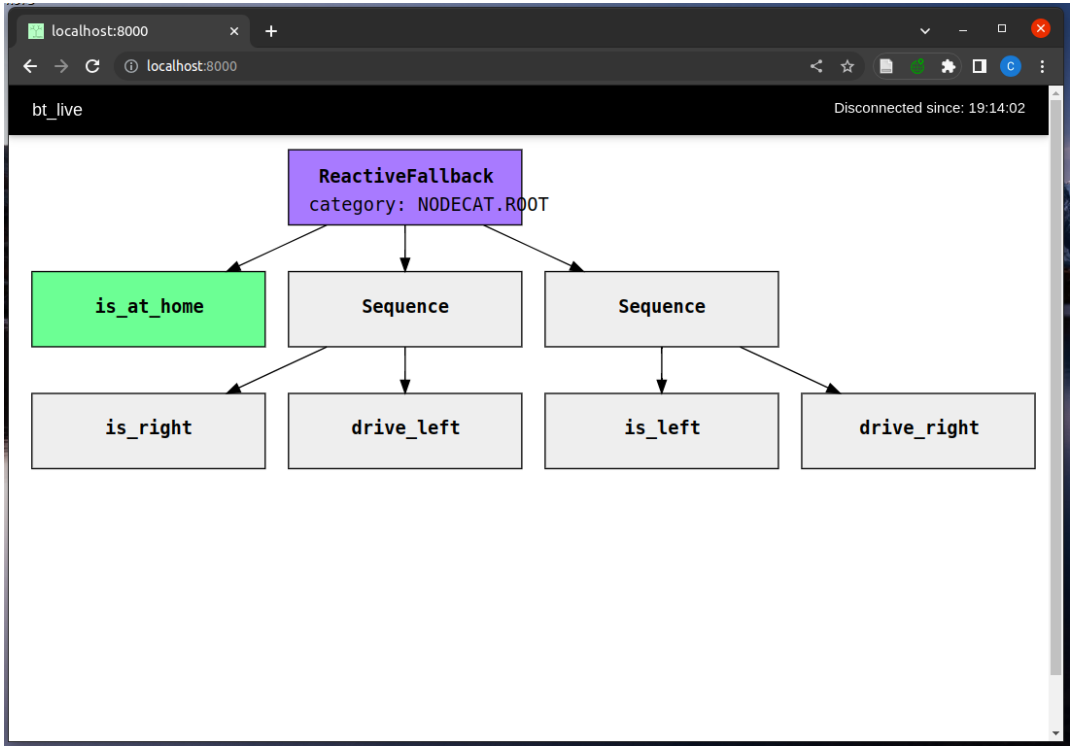
Tooling for Behavior Trees
Online Visualization: **bt_live**

https://github.com/boschresearch/bt_tools



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Deliberation Working Group

- Minutes and general info: https://bit.ly/delibwg
- To participate: https://groups.google.com/g/ros-wg-deliberation
- Recordings: https://www.youtube.com/playlist?list=PLcSZ3QEfuKf-CKfrcbtUehY4U1brNabnf
- Awesome list: https://github.com/ros-wg-delib/awesome-ros-deliberation

BT Tools

- Github: https://github.com/boschresearch/bt_tools

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