ROS 2 On the Browser with WebAssembly for Teaching Robotics

Isabel Paredes
Introduction
Motivation

- Accessibility
- Ease of Use
- Maintenance
- Reproducibility
Target Scenario

- Robotics instructor
- Gait generation for a heptapod
- Simulation
- Shareable with students
02 Methodology
Middleware

- ROS 2
- Interface
- Implementation
- rmw_wasm_cpp
- wasm_cpp
- wasm_js
- Embind

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Build Process

colcon

emscripten

JS

WA
03 Demos
ROS 2 on the Browser with WebAssembly

Publisher

START

STOP

CLEAR

Publisher initializing.

Subscriber

START

STOP

CLEAR
ROS Services

Server

START  STOP  CLEAR

Server initializing.

Client

START  STOP  CLEAR
LEGO Boost Vernie

- github.com/DerThorsten/lego-boost-browser
- Web Bluetooth API
Conclusion
Pros

✓ No installation
✓ No setup required by user
✓ For anyone with access to a modern web browser
✓ Reproducible environment
✓ Shareable via link

Cons

✗ Performance
✗ Complexity of deployment
✗ Missing features
Future Work

- RoboStack (conda packages)
- JupyterLite integration
Contributing

We want your help!
- Package management
- Middleware maintenance
- Front end development

Resources
- ros2wasm.dev
- github.com/ihuicatl/rmw_wasm
- ros2wasm.dev/pages/report/report.pdf

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Thanks!!