State of Gazebo 2024

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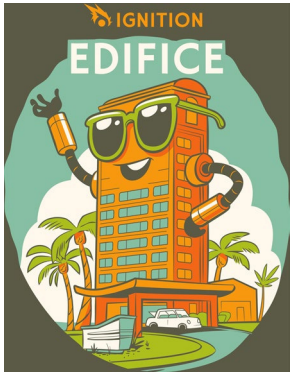
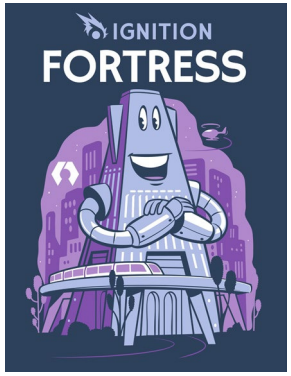
Outline

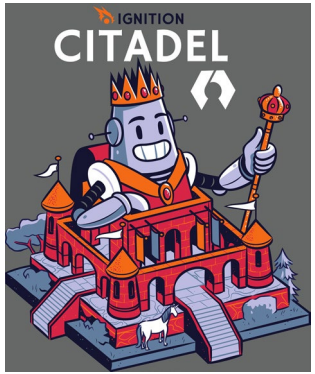
- Release update
- Migrating the community from Gazebo-classic
- Governance and Community
- New features in 2024
- Roadmap for Gazebo Jetty

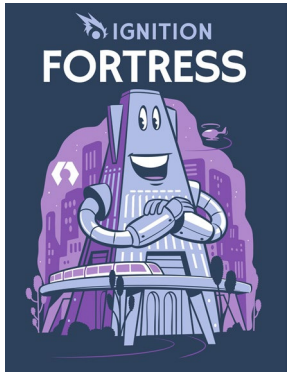
Gazebo Releases



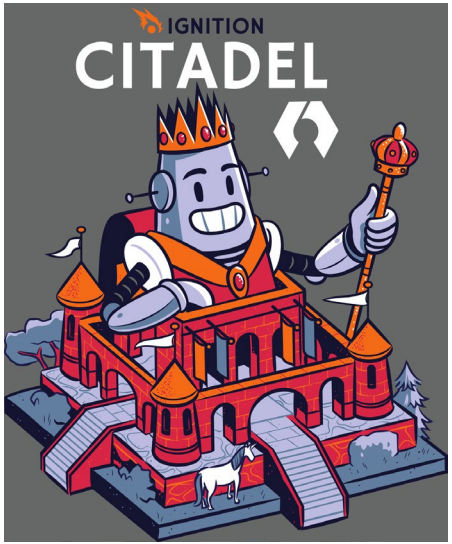


Gazebo Releases

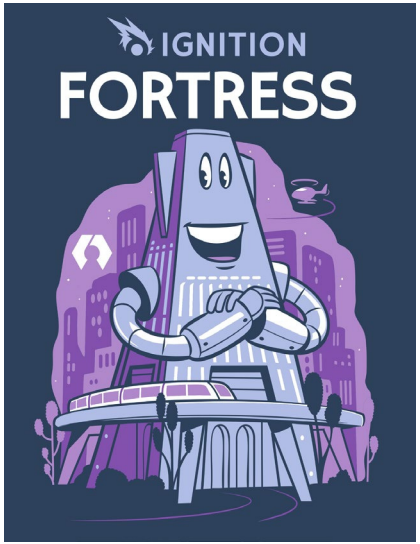




Currently supported releases:



Dec 2019–Dec 2024
Long Term Support (LTS)



Sep 2021–Sep 2026
(LTS)

Sep 2023–Sep 2028 (LTS)

Recommended

Sep 2024–Sep 2026

Recommended

Gazebo Ionic

Support Lifetime

Released on 2024-09-30 and will be supported for two years.

Platforms

Ubuntu 24.04

Paired with ROS 2 Rolling -> Kilted

Best Effort Platforms:

macOS

Windows 10, Windows 11, WSL

Ubuntu ARM64 Arch

Test & Tutorial Party Results

Tickets

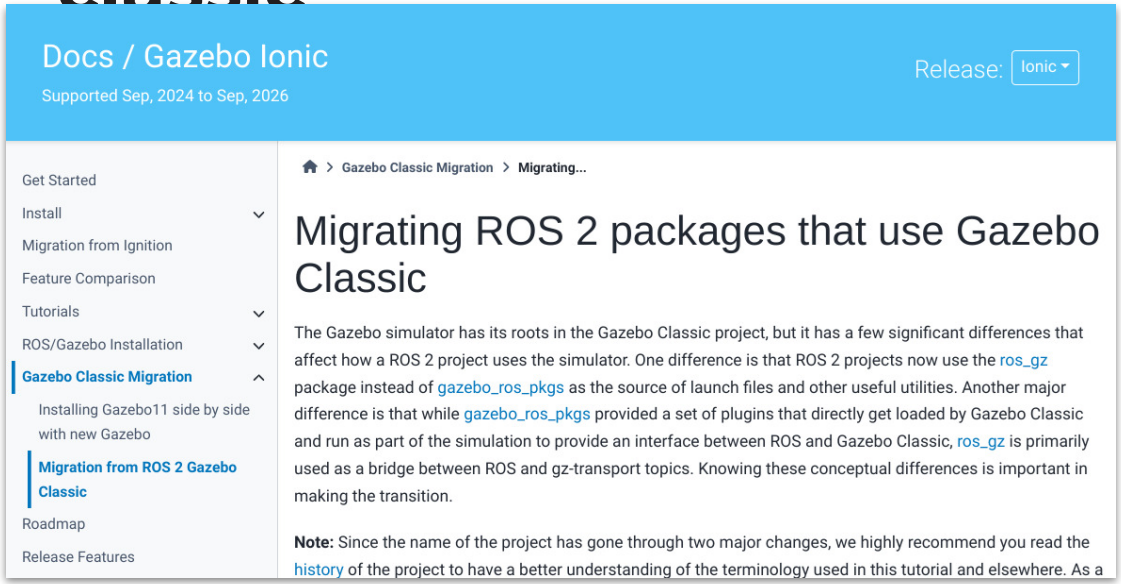
- Closed 413 out of 664 testing tickets
- Closed 151 out of 181 Ubuntu tickets
- Closed 64 out of 180 MacOS tickets
- Closed 77 out of 180 Windows tickets

General

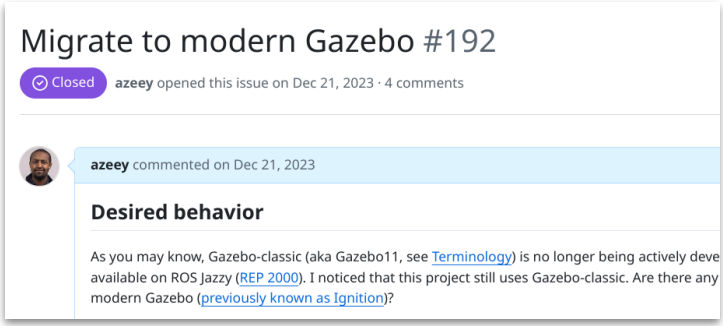
- 31 T&T party participants
- 56 PRs related to issues found during the T&T party

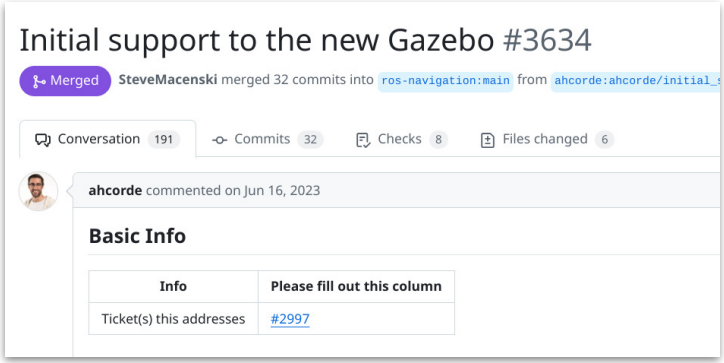
Gazebo-classic End-Of-Life January, 2025

Migrating the community from Gazebo-classic



https://bit.ly/gz-classic-migration





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Why Migrate?

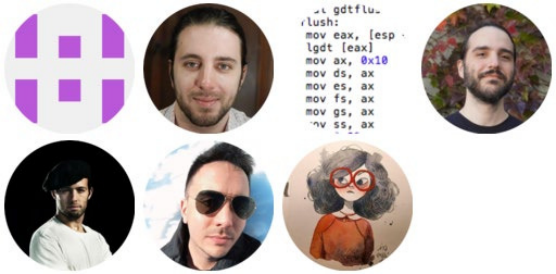
- New Gazebo Features
- Powerful flexibility
- Improved rendering with Ogre2
- Full support for DART and Bullet-Featherstone
- Libraries can be used by themselves. gz-math is used in Rviz
- Improved ROS 2 integration

Governance and Community

Governance

Project management committee

Committers



Meeting Info: https://bit.ly/gz-pmc-meeting

Community

(New) Gazebo Package Downloads	
September 2023	59998
September 2024	116941
Percent Change	94.91%
Based on stats from packages.ros.org	

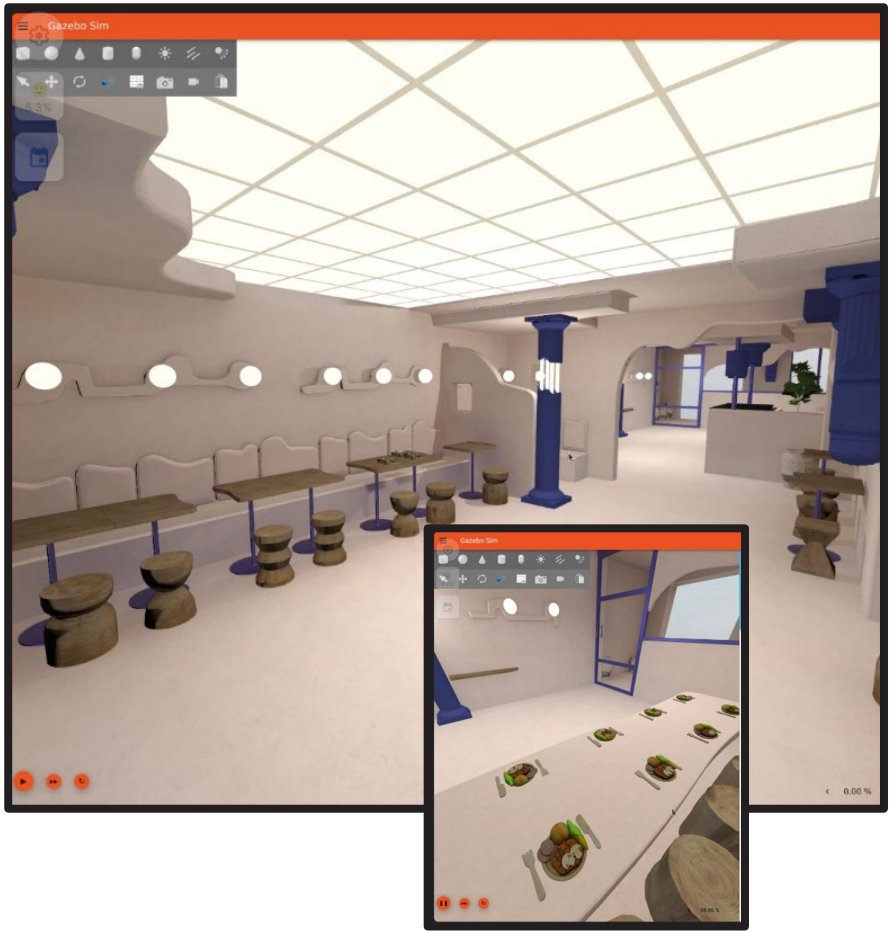
Gazebo Classic Package Downloads	
September 2023	86986
September 2024	63233
Percent Change	-27.31%
Based on stats from packages.ros.org	

% of New Gazebo of all Gazebo downloads: **64.90%**

% Growth of **total** Gazebo downloads between 09/2023 and 09/2024: **22.58%**

New Features in Ionic

bit.ly/GzIonicHighlights



Ionic Demo World

Our Ionic demo world is an indoor restaurant scene that's perfect for service robots!

The space shows off our new auto-deactivation and simplified collision meshes.

NAV2

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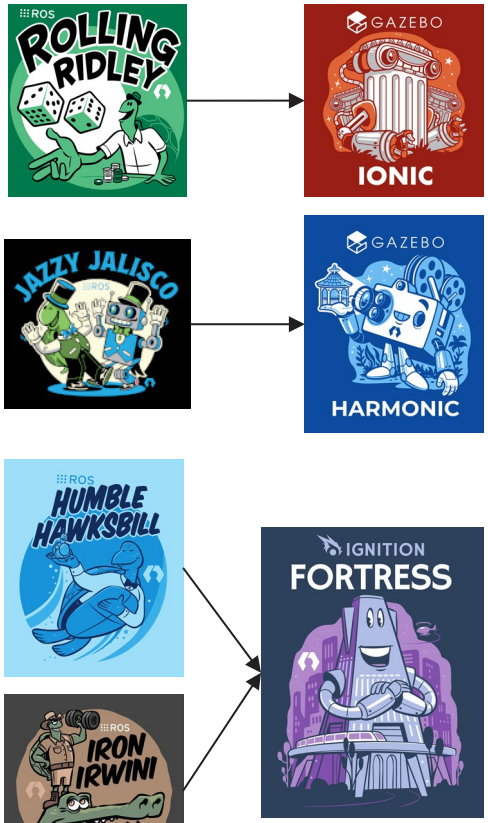


Gazebo ROS Vendor Packages

What are Vendor Packages?

A ROS vendor package is a ROS package that provides software that ROS needs on platforms where it might not be available, or where a different version than what is available is required [1]

What do we get?

- Gazebo packages built on the ROS buildfarm
- One-to-one Gazebo/ROS pairing
- CMake shims that make it possible to use CMake targets without version numbers

[1] https://robotics.stackexchange.com/a/93262/31574

ROS GZ Bridge Improvements

Faster ROS / Gazebo Communication

The new `use_composition` parameter gives us the ability to run Gazebo, the `ros_gz_bridge`, and other composable ROS nodes within the same process.

Use Composition

This significantly improves performance by avoiding message serialization and network transport between Gazebo and ROS.

Improved Launch Files

New launch actions are available that improve the ergonomics of creating launch files that start Gazebo, the `ros_gz` bridge and spawn models.

Start Gazebo server, ros_gz bridge, spawn model

```
<launch>
  <let name="pkg_path" value="$(find-pkg-share my_package)" />
  <gz_server world_sdf_file="$(var pkg_share)/worlds/my_world.sdf" />
  <ros_gz_bridge bridge_name="br1" use_composition="True”
    config_file="$(var pkg_path)/config/bridge_config.yaml" />
  <gz_spawn_model world="my_world" file="$(var pkg_path)/models/my_robot)" />
</launch>
```

Performance Improvements

Rendering sensor improvements

Rendering sensors like Cameras and Lidars are now more efficient

Bullet-featherstone auto-deactivation

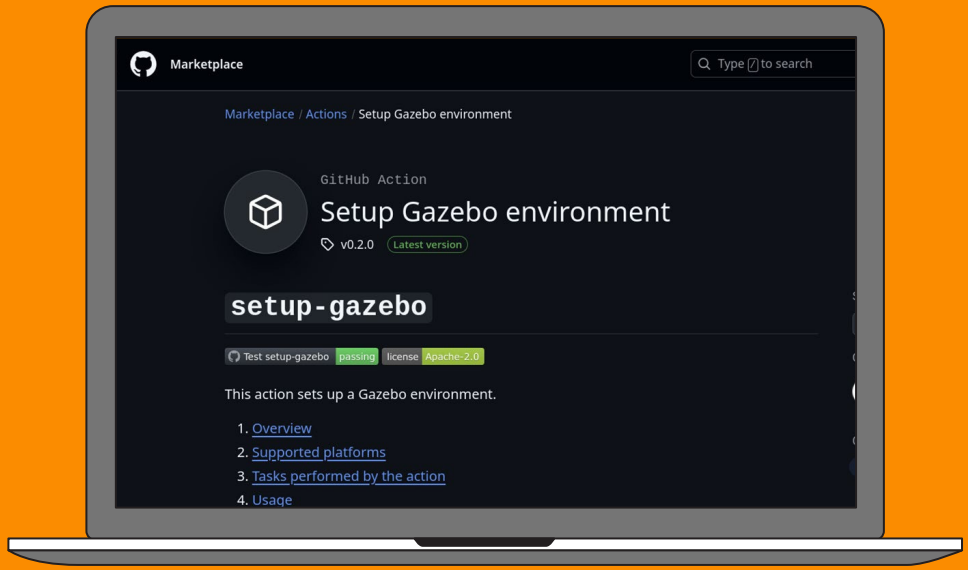
Objects that have stopped moving are deactivated automatically leading to significant real-time-factor (RTF) improvement

Automatic convex decomposition

Use the V-HACD library to perform convex decomposition to speed up collision checking increase RTF

Setup Gazebo Github Action

We've released a Github Action to setup a Gazebo environment as part of your CI / CD pipeline



bit.ly/GzIonicAction

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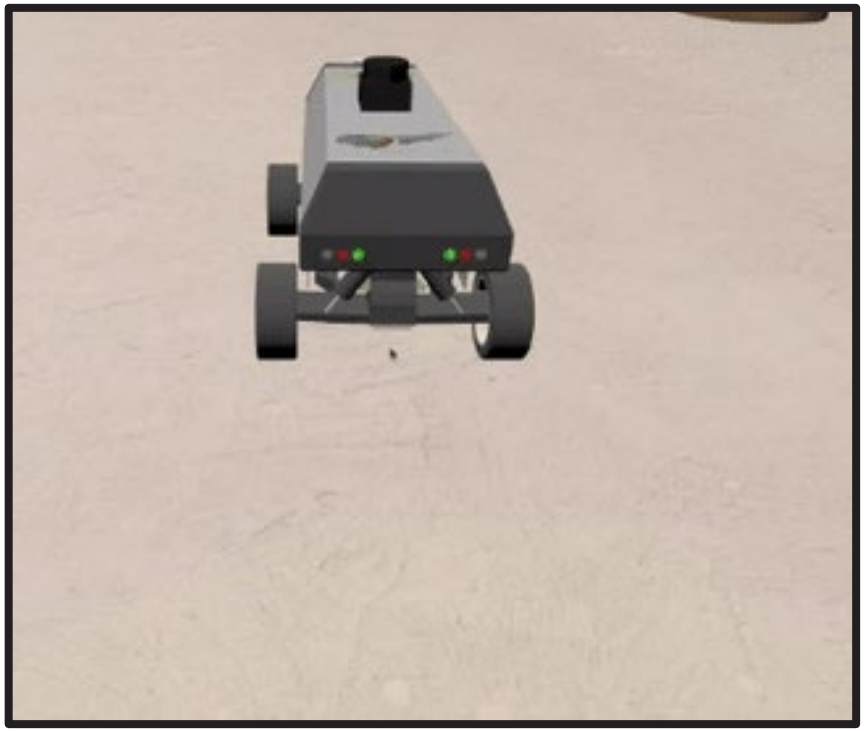


Dynamic Materials

A new collection of features have been added that allow users to change material translucence and emissivity. This allows users to build lights, LEDs, etc and change them via GZ and ROS topics!

Details: bit.ly/GzIonicLights

Specify Execution Order for System Callbacks

xml

```
<gz:system_priority>
```

Better Control over Multiple Plugins

The order of execution for `PreUpdate` and `Update` callbacks for a system can be specified using an integer priority value, with smaller values executing first.

C++

```
SystemConfigurePriority
```

A default system priority can be specified at compilation time by implementing a new `SystemConfigurePriority` interface, and the priority can be overridden by specifying an XML parameter in the system's SDFormat `<plugin/>` tag.

Learn More: bit.ly/GzUpdateOrder

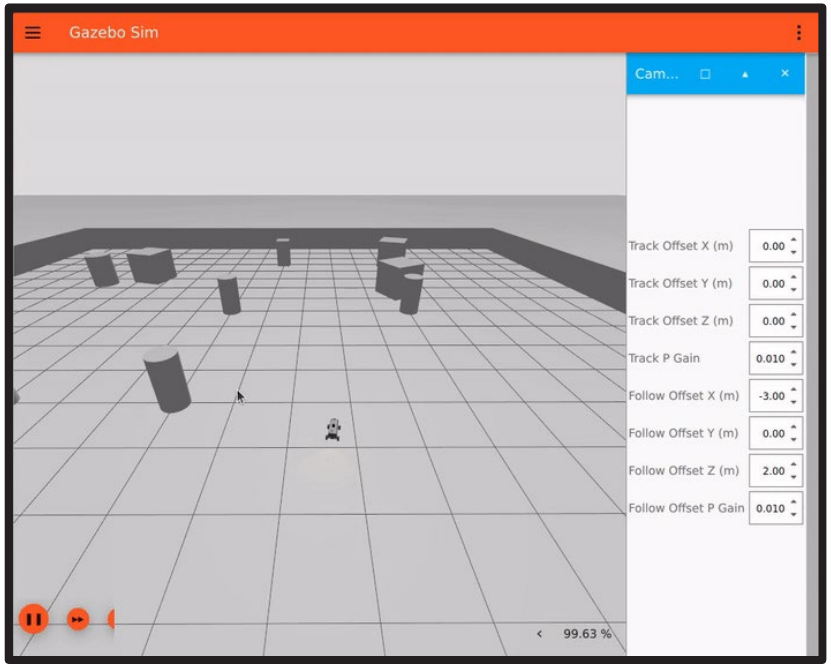
Improve determinism of `ForceTorque` sensor

ForceTorque sensors Write to the ECM

This is in addition to publishing to a gz-transport topic, offering a more deterministic data path for sensor data.

This feature uses the new system execution order priority to ensure that the `ForceTorque Update` callback occurs after the physics system update offering a more deterministic data path for sensor data

Learn More: bit.ly/GzIonicForceTorque



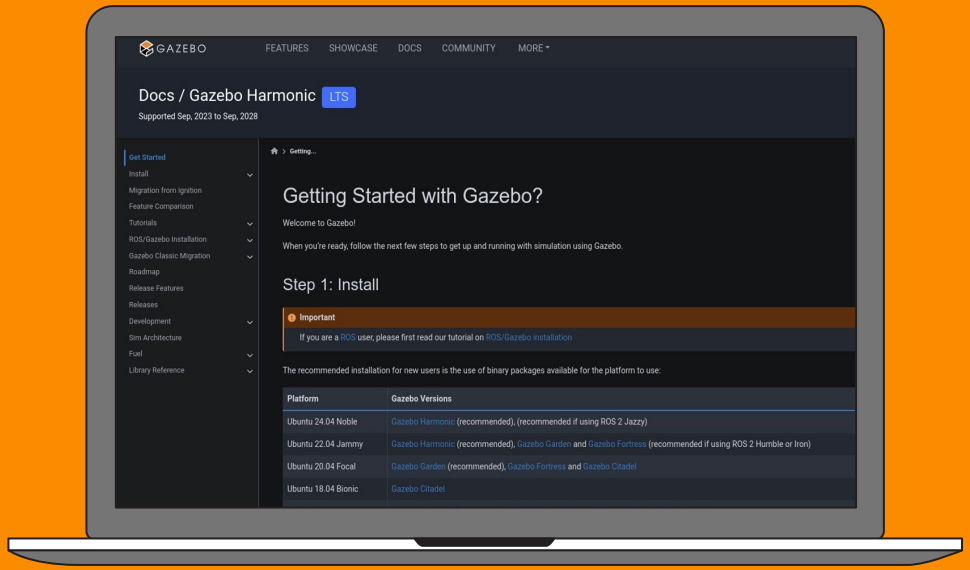
Follow Me Mode in the Gui

We've added a ton of configuration options for following an entity. Users can customize this view for a variety of different applications.

bit.ly/GzFollowMe

Sphinx Documentation

We ported all Gazebo documentation to Sphinx. It is easier to use, searchable, and supports dark mode.



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Gazebo Jetty Roadmap*

*This is a tentative/early stage roadmap and is subject to change

Qt5->Qt6 migration

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Federated
Third party plugins

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gzweb

Use Zenoh in gz-transport

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RL interface

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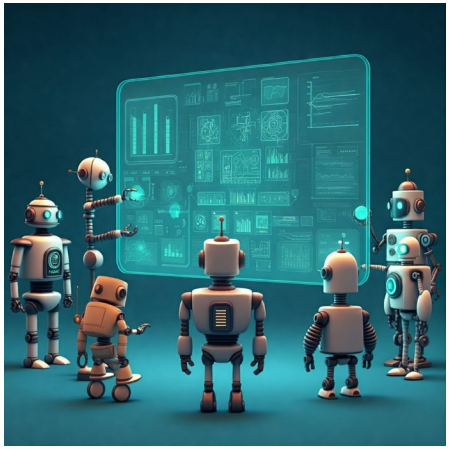
How to get involved



Robotics Stack Exchange

https://community.gazebosim.org/

Gazebo channels on the Open Robotics Discord

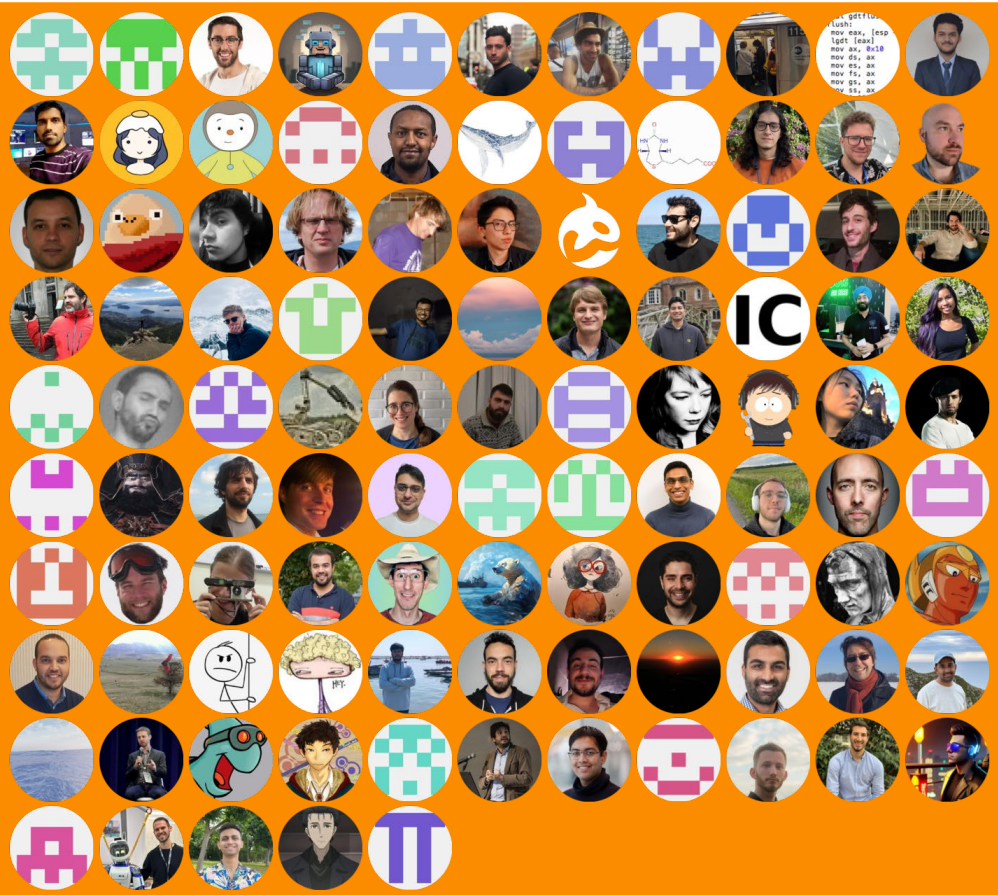
Monthly Gazebo Community Meetings

Pull requests to our GitHub repositories: gazebosim

- Look for “**good first issue**” and “**help wanted**” labels
- Contributing guidelines
  gazebosim.org/docs/latest/contributing

Google Summer of Code / Google Season of Docs internships

Thank You



To see the full list of contributors, visit https://community.gazebosim.org/t/gazebo-ionic-release/3088

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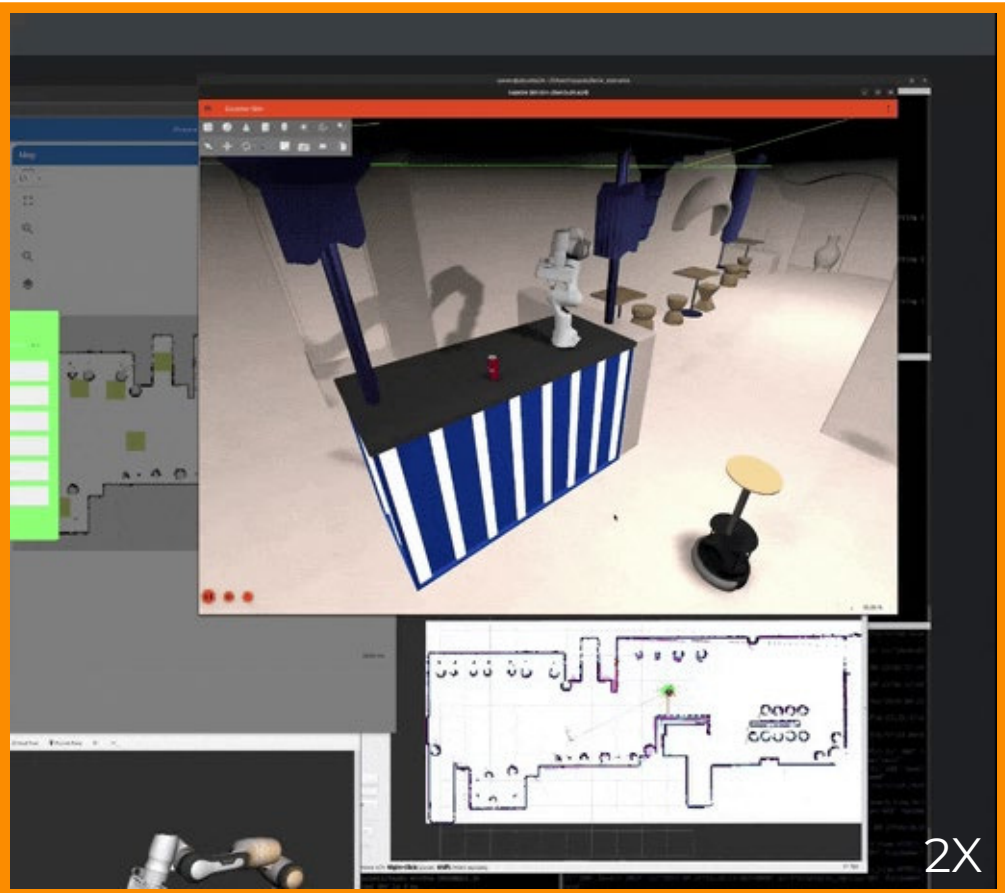
Thanks

- PMC members
- Committers
- T&T Participants
- Community



https://github.com/gazebosim/ionic_demo

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