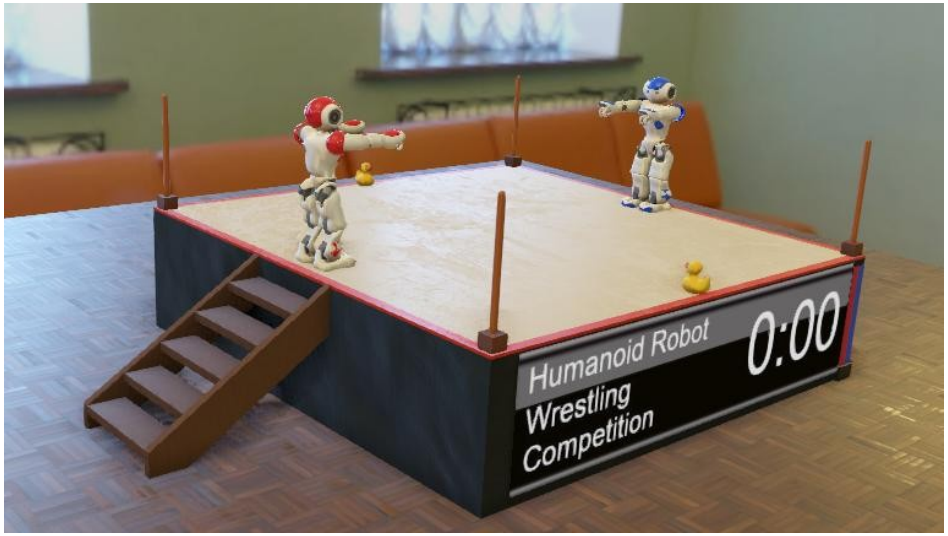


https://github.com/cyberbotics/wrestling

ICRA 2023
Simulated Humanoid Robot Wrestling Competition

January 16th – June 2nd, 2023

Olivier Michel – Cyberbotics Ltd.

Motivation

A Popular Robotics Benchmark to Assess Progresses in Robotics Research

1. **Free and Open-Source**
   > rely on a fully open-source stack (Webots, webots.cloud, ROS 2, Python, Rust, C, C++, Java, etc.)

2. **Entertaining and Addictive**
   > view 3D animations of games online / leaderboard / discussion forum

3. **Easy-to-Use**
   > no hardware / web / easy registration / simple participant workflow / documentation / examples

4. **Scalable and Open**
   > participant code hosted on GitHub / executed in custom Docker containers

5. **Customizable**
   > anyone can easily create their own competition scenario

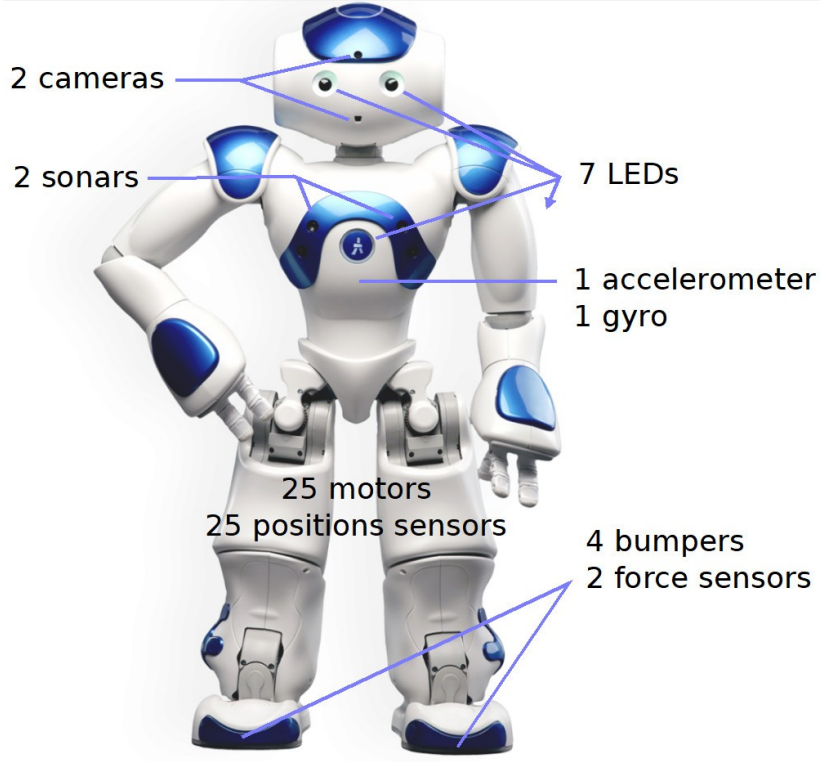
Scenario

Humanoid Wrestling

1. **Addressing true robotics challenges**
   - > SLAM
   - > navigation
   - > humanoid walking
   - > vision
   - > grasping

2. **Fairly easy to get started with**
   - > only one robot to program
   - > examples
   - > motion files
   - > Python libraries: motions, walk, vision, etc.

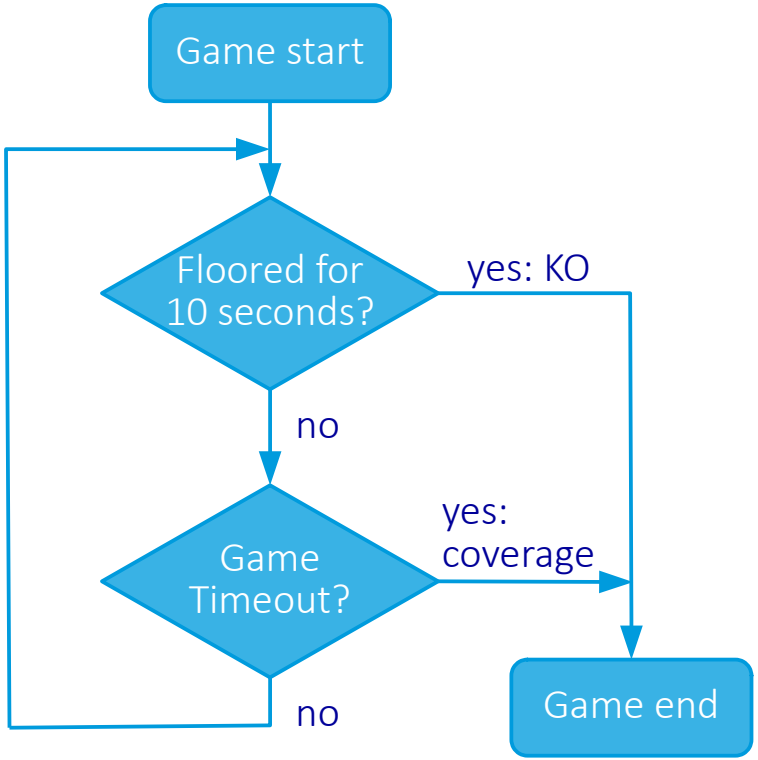
3. **Entertaining**

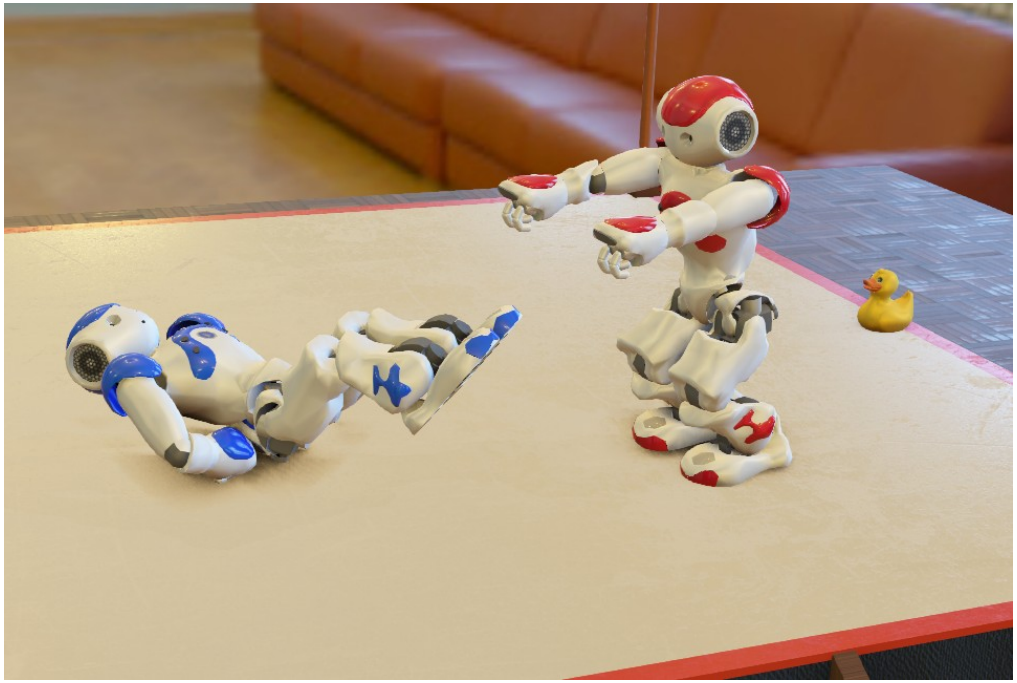


Rules

Flooring the Opponent

All Shots Allowed



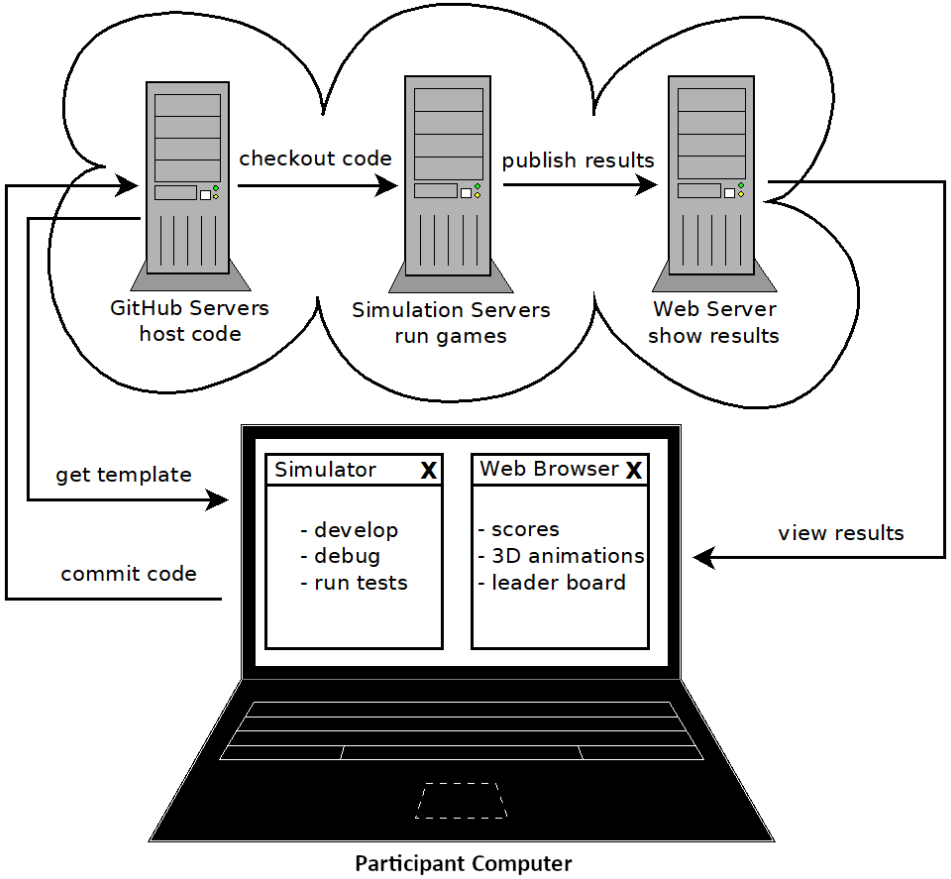


Leaderboard

Leaderboard

Ranking	Country	Name	Updated	
1		SugarSkull	16/02/2023 04:28:09	
2		KAIZEN	16/02/2023 04:28:09	View
3		Team Saitama	16/02/2023 02:30:13	View
4		Mohammad Javad Zallaghi	15/02/2023 21:24:57	View
5		manuxd	15/02/2023 21:22:47	View
6		pemile	15/02/2023 23:55:53	View
7		Sagwl	15/02/2023 21:19:20	View
8		Chrake Peith	15/02/2023 21:11:05	View
9		Dumul	15/02/2023 21:02:42	View
10		Brice T.	15/02/2023 05:53:24	View
11		Shane Copenhagen	15/02/2023 05:44:30	View

Participant Workflow



ROS 2 integration

Based on Vulcanexus Humble Docker images

Vulcanexus humble-simulation or humble-desktop Docker image

> https://hub.docker.com/r/eprosima/vulcanexus
> contains webots_ros2 package and ROS 2 base packages

Alice ROS 2 example

> https://github.com/cyberbotics/wrestling-alice-ros-2/

Dockerfile

```
FROM eprosima/vulcanexus:humble-simulation-2.1.1
WORKDIR /usr/local/webots-project/controllers/participant
RUN mkdir -p /usr/local/webots-project/controllers
COPY . /usr/local/webots-project/controllers
RUN apt-get update && apt-get install -y python3-colcon-common-extensions && rm -rf /var/lib/apt/lists/* && colcon build
ARG WEBOTS_CONTROLLER_URL
ENV WEBOTS_CONTROLLER_URL=${WEBOTS_CONTROLLER_URL}
CMD . /opt/ros/humble/setup.sh && . /usr/local/webots-project/controllers/participant/install/setup.sh && \
ros2 launch participant robot_launch.py
```

Finals

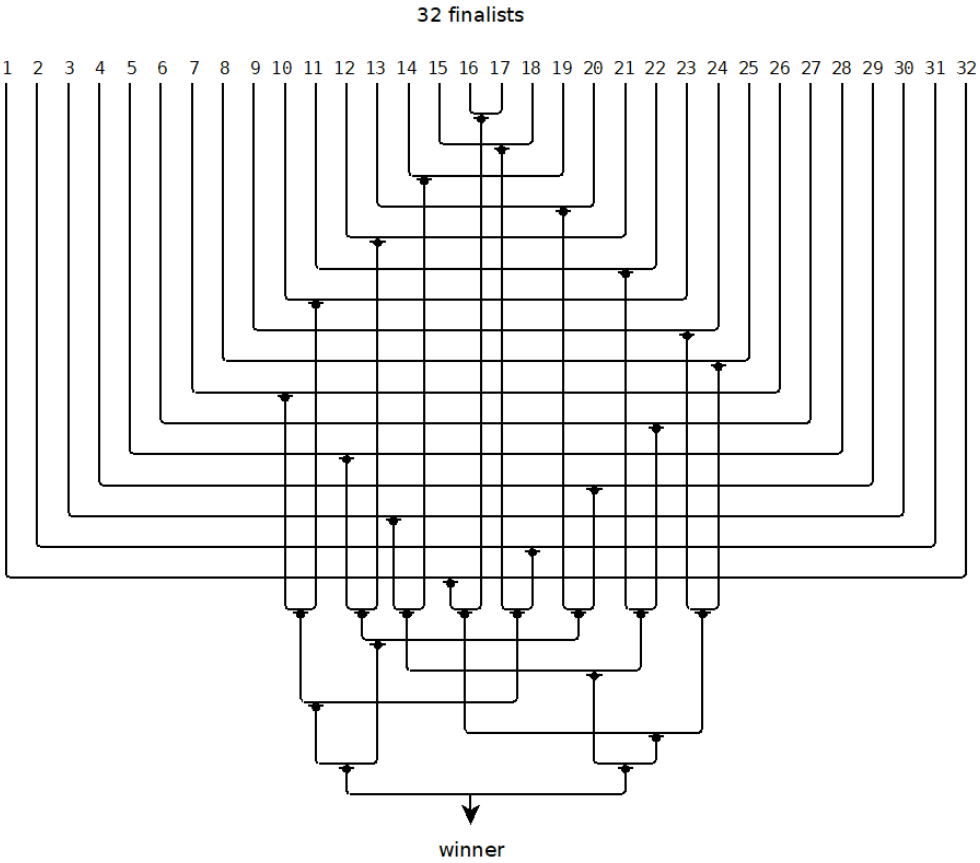
Selection of the 32 best teams from the leaderboard

Live event at ICRA 2023: May 30th - June 2nd

Remote participation allowed

Tournament style finals with direct elimination

The winner will receive 1 ETH (~ 1,500 USD)



Conclusion

Competition started on January 16th, 2023

As of today (Feb 16th 2023):

> 33 teams participating + 11 demo controllers
> Most participants using the simple Python API
> 2 teams using ROS 2 + 1 demo controller using ROS 2
> Expecting more teams to join using ROS 2 or existing teams to switch to ROS 2
> Robot performance not super impressive so far

Goal (June 2nd, 2023):

> What will ROS 2 participants request to simplify their workflow?
> What tools and documentation will we provide to help them?
> How many ROS 2 controllers will be present in the top-32 leaderboard?
> Will ROS 2-based controller outperform others? Win the competition?
> Will the participants develop, share some specific ROS 2 tools or packages?