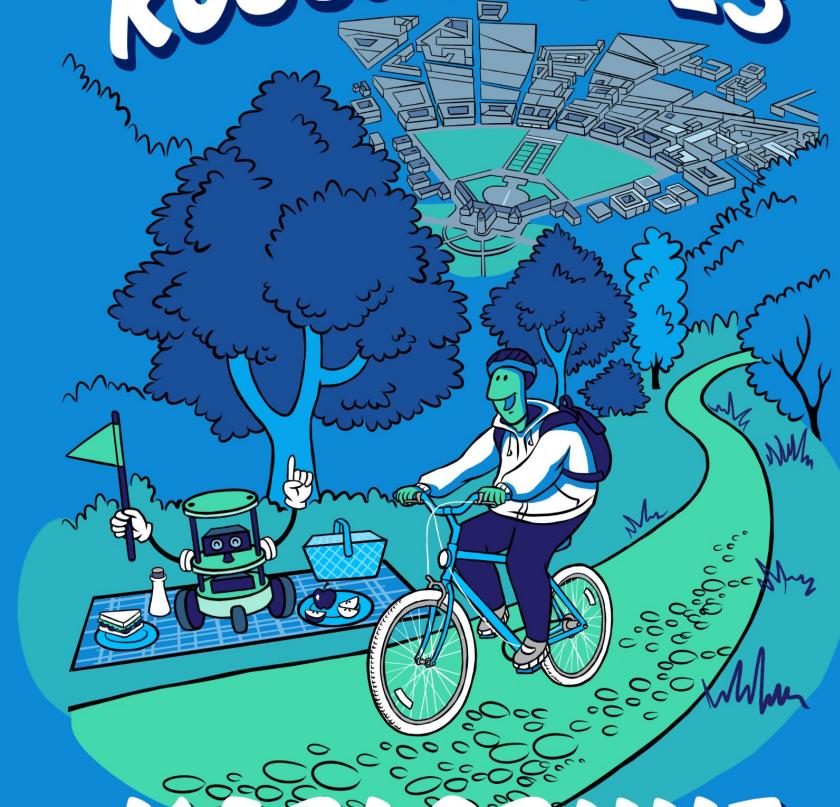


ROSCon DE '23



KARLSRUHE

ROSbloX: Schnelleinstieg in hochwertige ROS-Robotik ohne Vorkenntnisse

Max Polzin

max.polzin@epfl.ch

24.11.2023

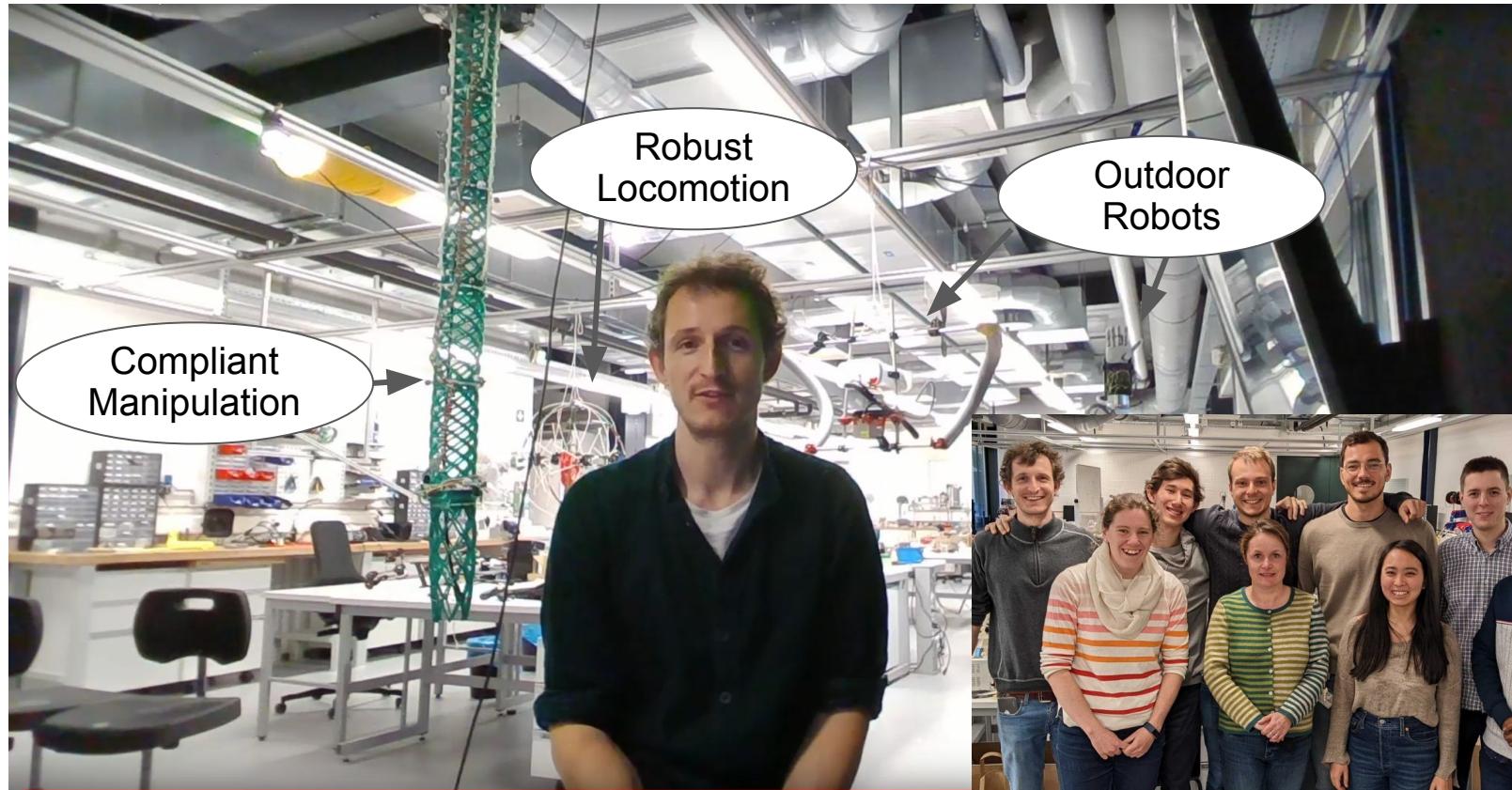
CREATE
Lab **EPFL**



CREATE
Lab **EPFL**

Computational Robot Design & Fabrication Lab

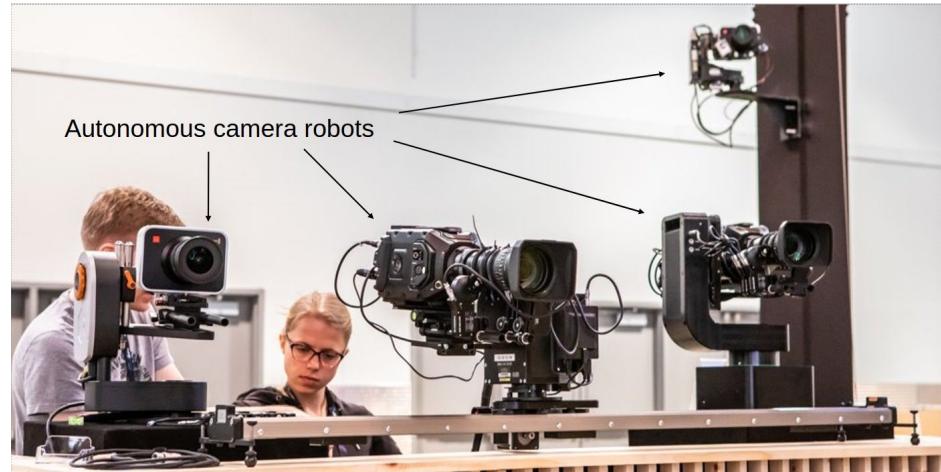
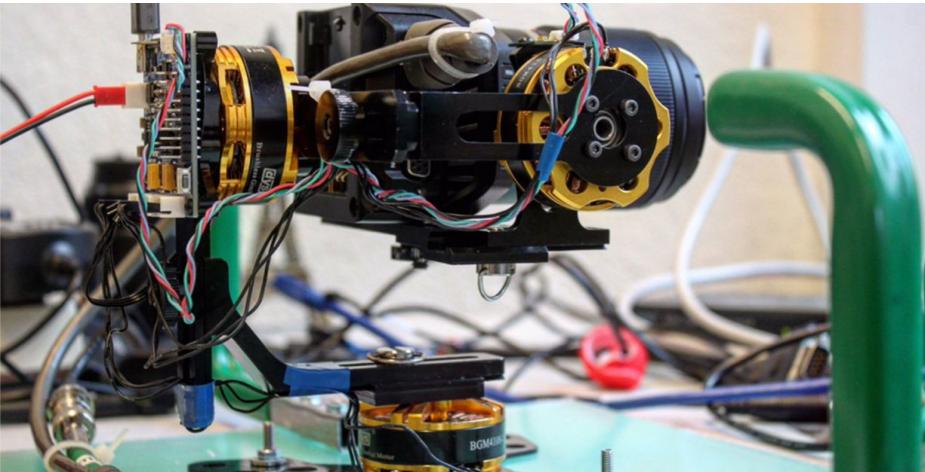
CREATE
Lab **EPFL**



Tethered Robotic eXplorer (TReX)



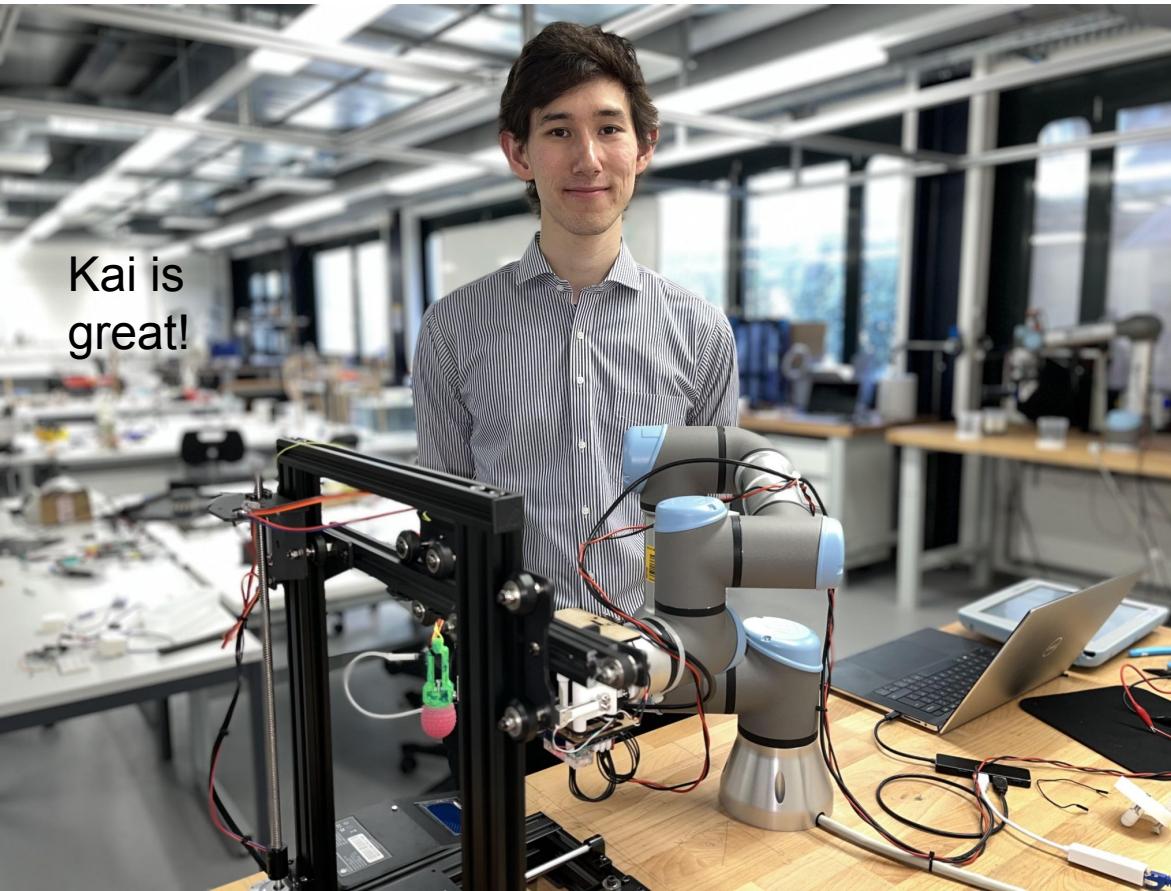
Institute for Aerospace Studies
UNIVERSITY OF TORONTO



Q-SYS to Acquire Seervision



Kai struggles starting with robots...



Kai is great!

Background:

- Matlab Pro
- (Some) Python experience

Task: Measuring orientation

1. Get IMU
2. Wire IMU and SBC (I2C)
3. Install Linux
4. Setup network
5. Understand SSH and Terminal
6. Install ROS + tools
7. (Clone repo)
8. (Compile packages)
9. Start IMU ROS node

Kai struggles starting with robots...



Kai is
great!

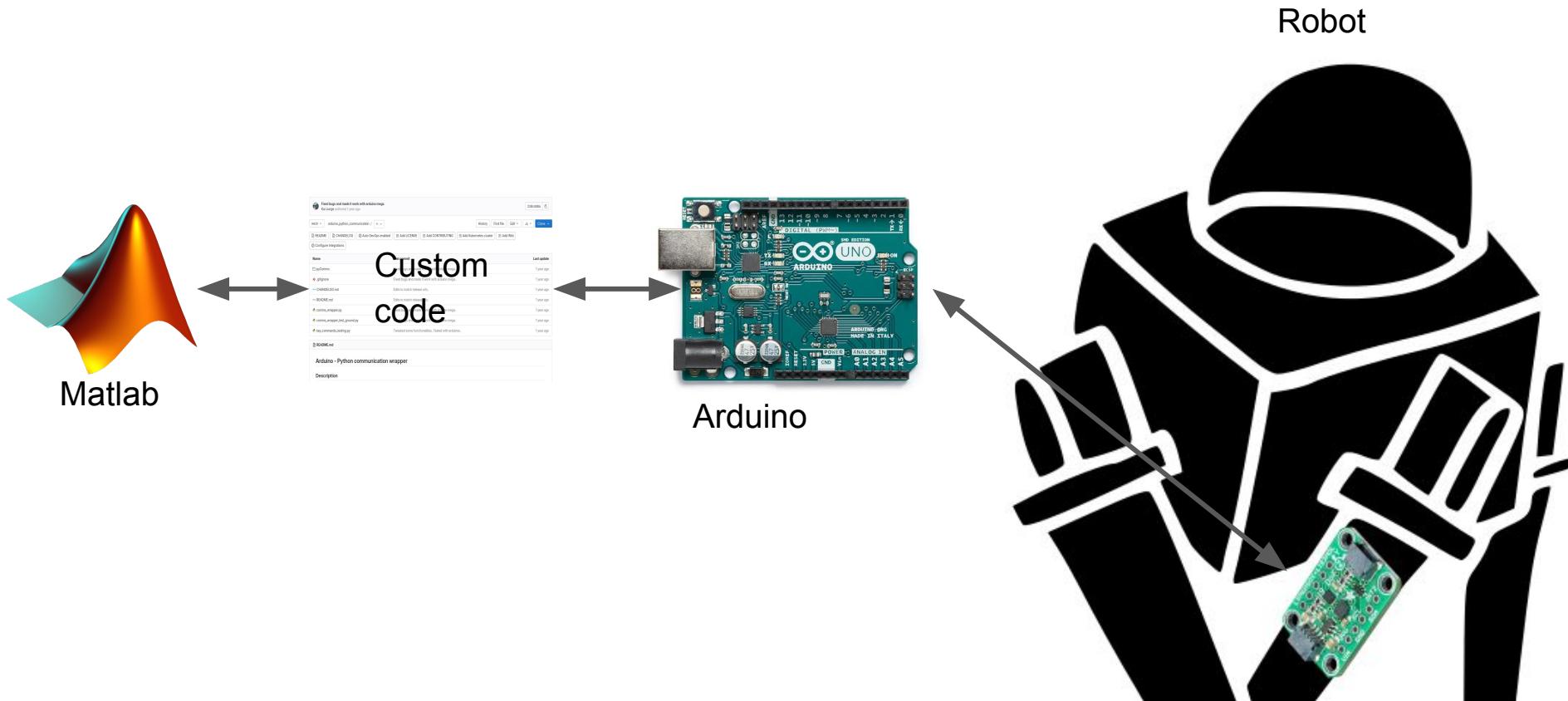
Background:

- Matlab Pro
- (Some) Python experience

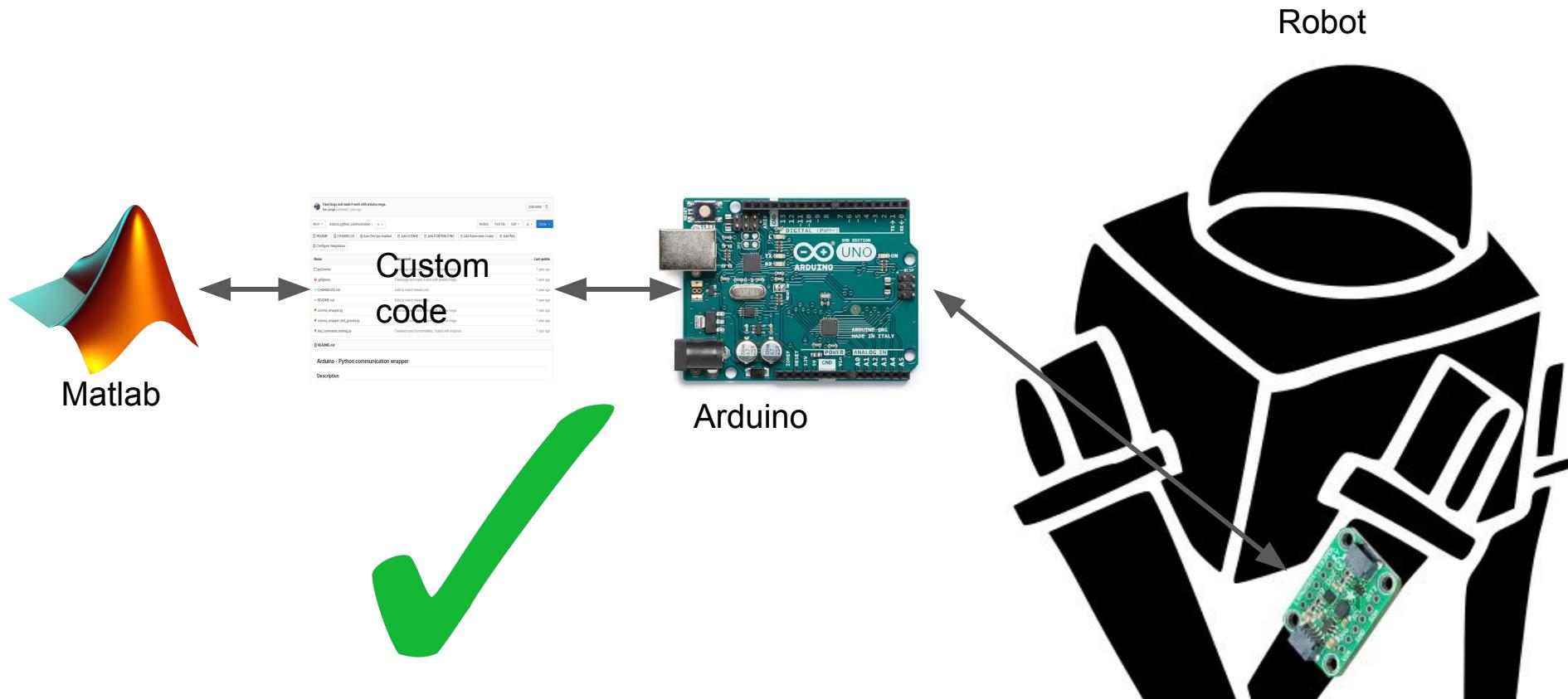
Task: Measuring orientation

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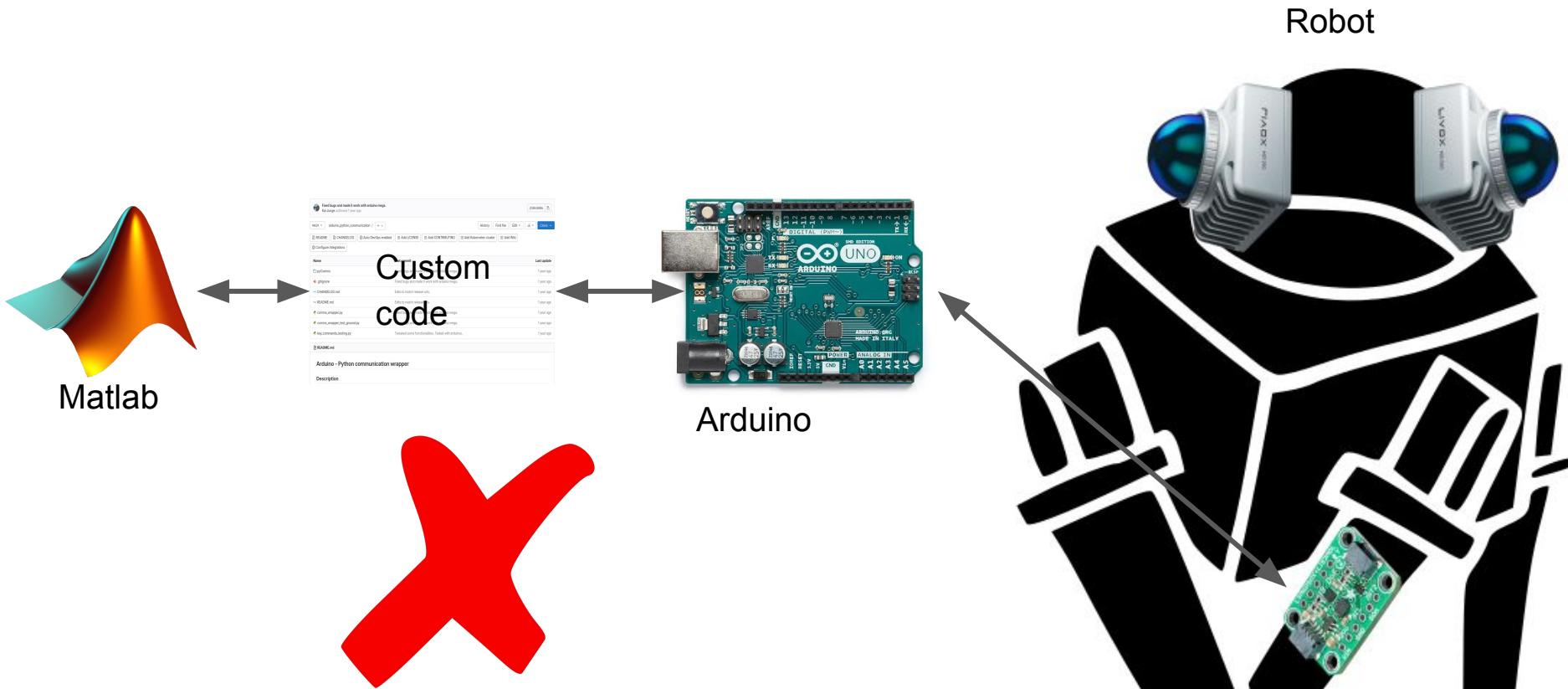
Task: Measuring Orientation



Task: Measuring Orientation



Task: Measuring orientation + Recording LiDAR data

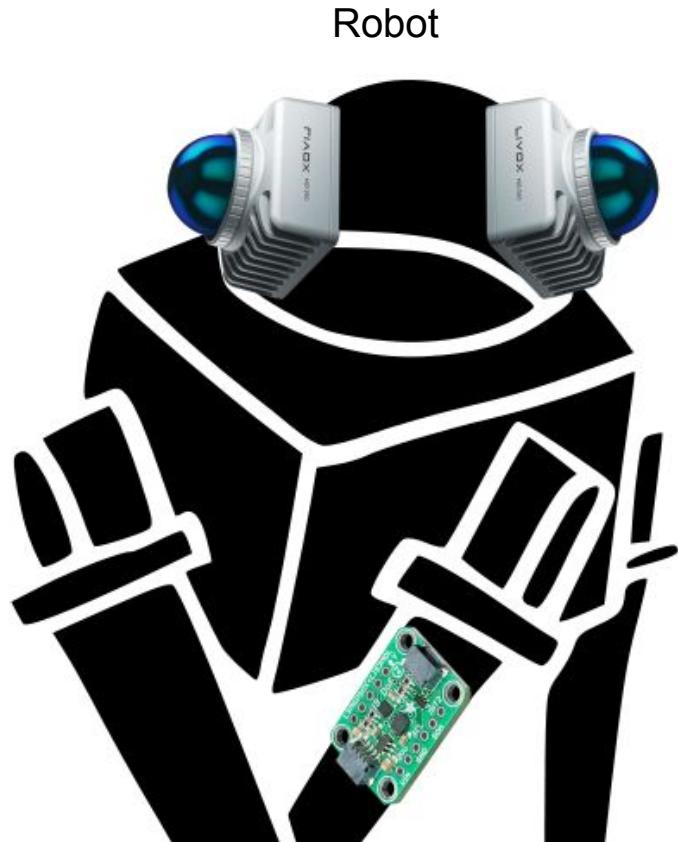
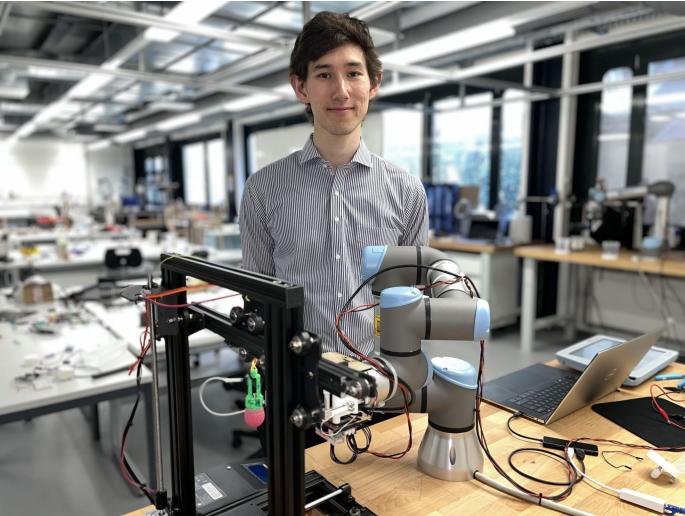


Task: Measuring orientation + Recording LiDAR data

What Kai wants: Get his task done!

What would help Kai?

- a. Plug-and-play connectivity
- b. Integrated data visualization
- c. Modularity to extend





Home / The ROSbloX documentation

Edit on GitHub

ROSbloX

Building high-quality, ROS-powered robots with no prior experience about ROS networking and programming?

ROSbloX are your ultimate building blocks for rapidly creating a robot's software stack. They feature **plug-and-play connectivity** and **integrated data visualization**.



Blox Livox Mid-360

1. Plug-and-play connectivity
2. Integrated data visualization
3. Modularity to extend

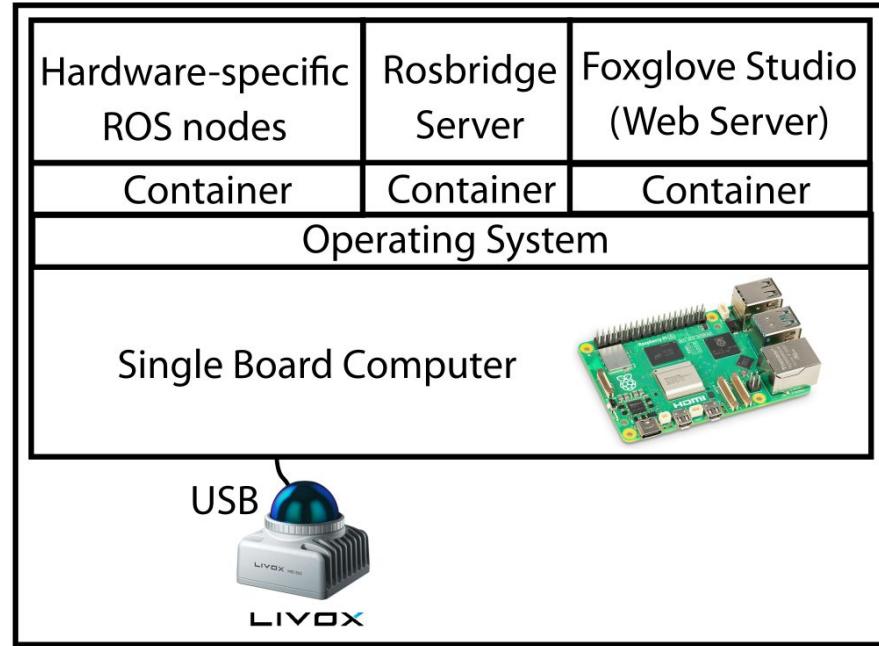
ROSbloX

1. Plug-and-play connectivity
2. Integrated data visualization
3. Modularity to extend



Blox Livox Mid-360

ROSbloX - Livox Mid-360 LiDAR



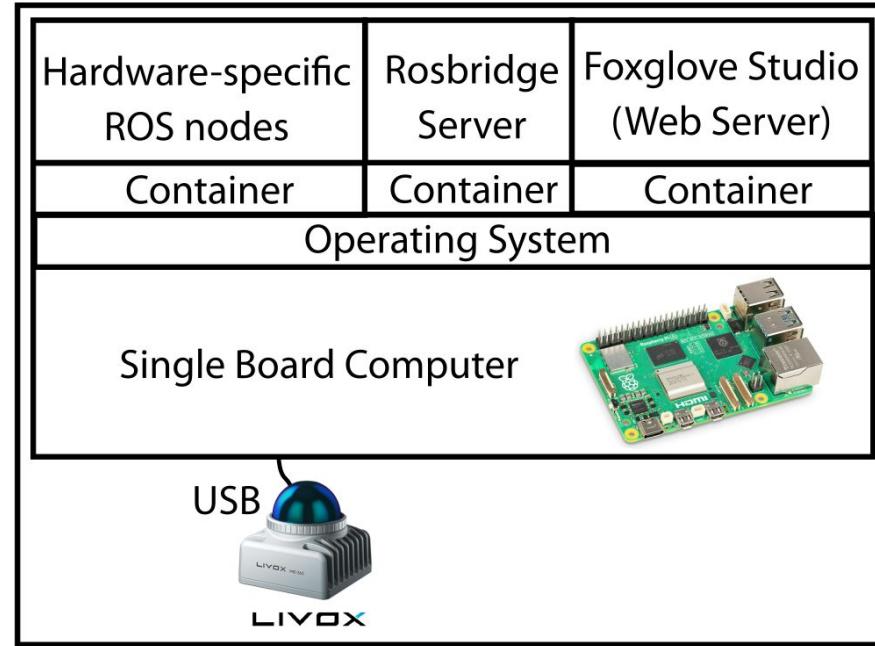
ROSbloX

1. Plug-and-play connectivity
2. Integrated data visualization
3. Modularity to extend

.... without writing
more code.



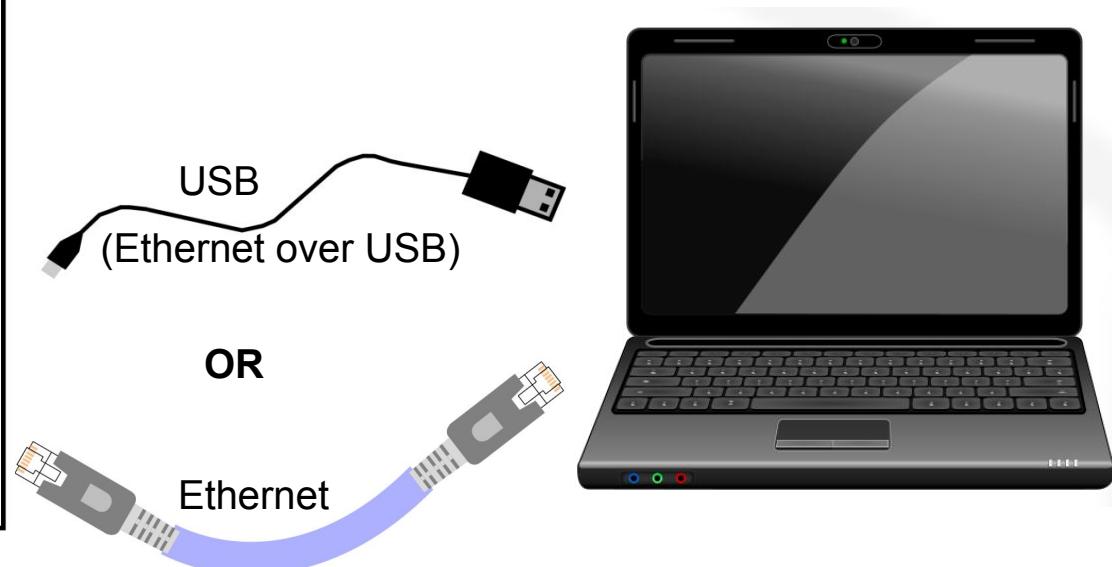
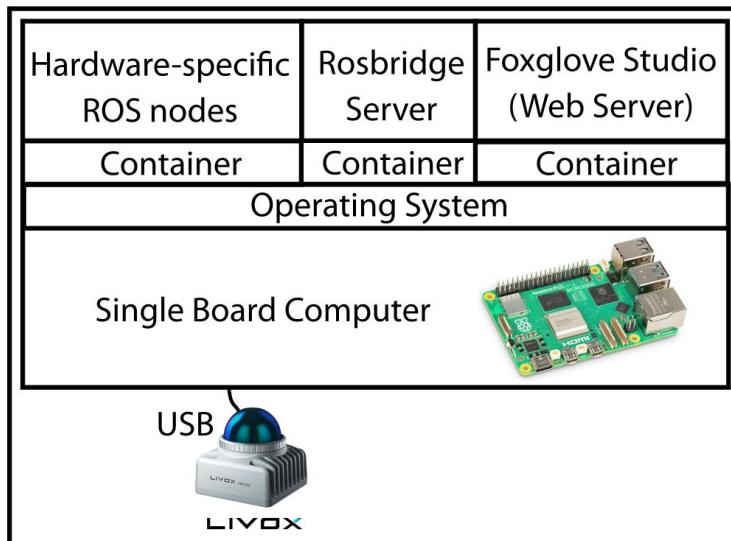
ROSbloX - Livox Mid-360 LiDAR



ROSbloX

1. **Plug-and-play connectivity**
2. Integrated data visualization
3. Modularity to extend

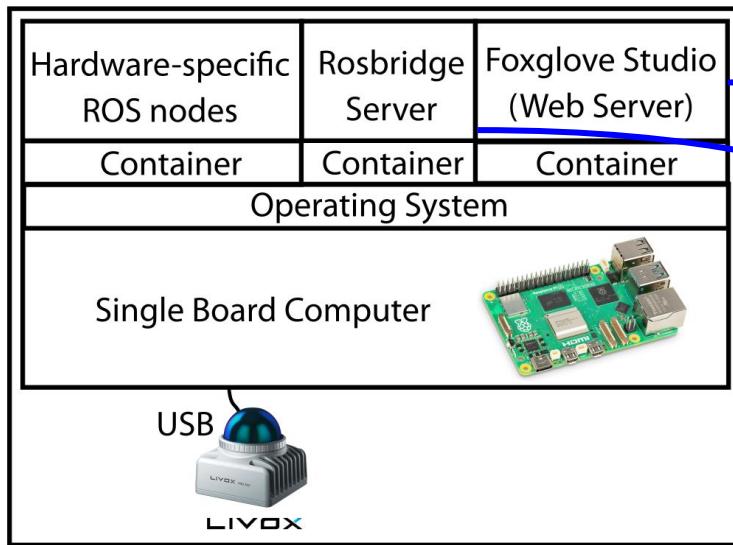
ROSbloX - Livox Mid-360 LiDAR



ROSbloX

1. Plug-and-play connectivity
2. **Integrated data visualization**
3. Modularity to extend

ROSbloX - Livox Mid-360 LiDAR



Foxglove Studio
Web-GUI

Chrome/Firefox Browser

Rosbridge Server





BloX LSM6DSOX-LIS3MDL: 9-DoF IMU

ws://10.99.11.1:9090 - Foxglove Studio - Google Chrome

ws://10.99.11.1:9090/?006/camerabridge-websocket&id=urn:uuid:93A82F...

Not secure

Open settings to configure topics and layers.

Data source

CURRENT SOURCE ws://10.99.11.1:9090

START TIME 2023-01-28 5:07:46.154 (UTC)

END TIME 2023-01-28 6:08:05.259 (UTC)

DURATION (X) 8.00137 128

Topics Problems

Filter by topic or datatype

ros_odomdsosx

Filter by topic or datatype

/clock

/geometry_msgs/msg/PointStamped

/clone_count

/std_msgs/msg/Int32

/connected_clients

/network_interfaces/ConnectedK...

/imuData

/sensor_msgs/msg/Imu

/imuData_twh

/sensor_msgs/msg/Twist

/Arming

/sensor_msgs/msg/RegionOfInterest

/ArmingState

/glocom_msgs/msg/ArmingState

/move_base_simple/goal

/geometry_msgs/msg/PointStamped

/parameter_events

/m2l_imu_interfaces/msg/MagneticField...

/jerkroll

/m2l_imu_interfaces/msg/Imu

100 100_imu/sig/Message 10.02 Hz



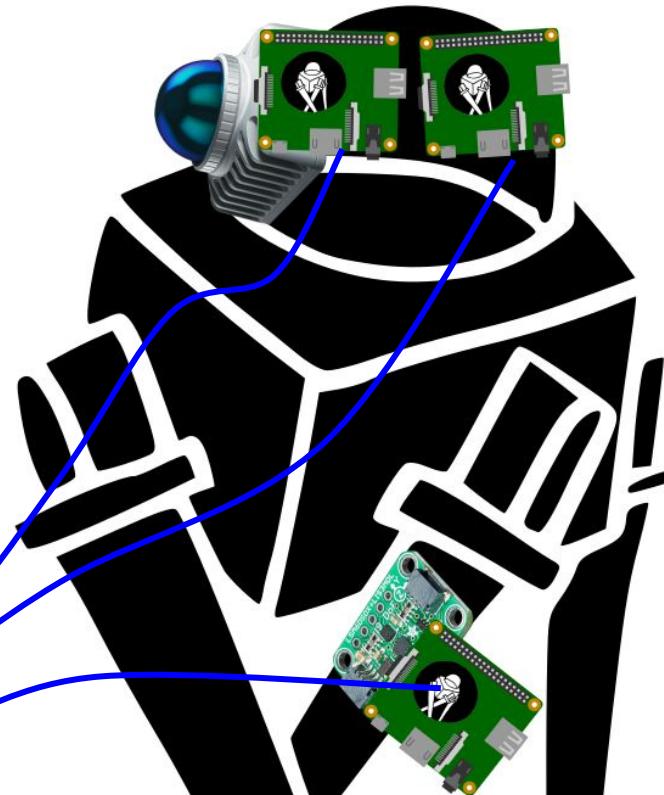
ROSbloX

1. Plug-and-play connectivity
2. Integrated data visualization
3. **Modularity to extend**

Foxglove Studio
(web-based GUI)

+

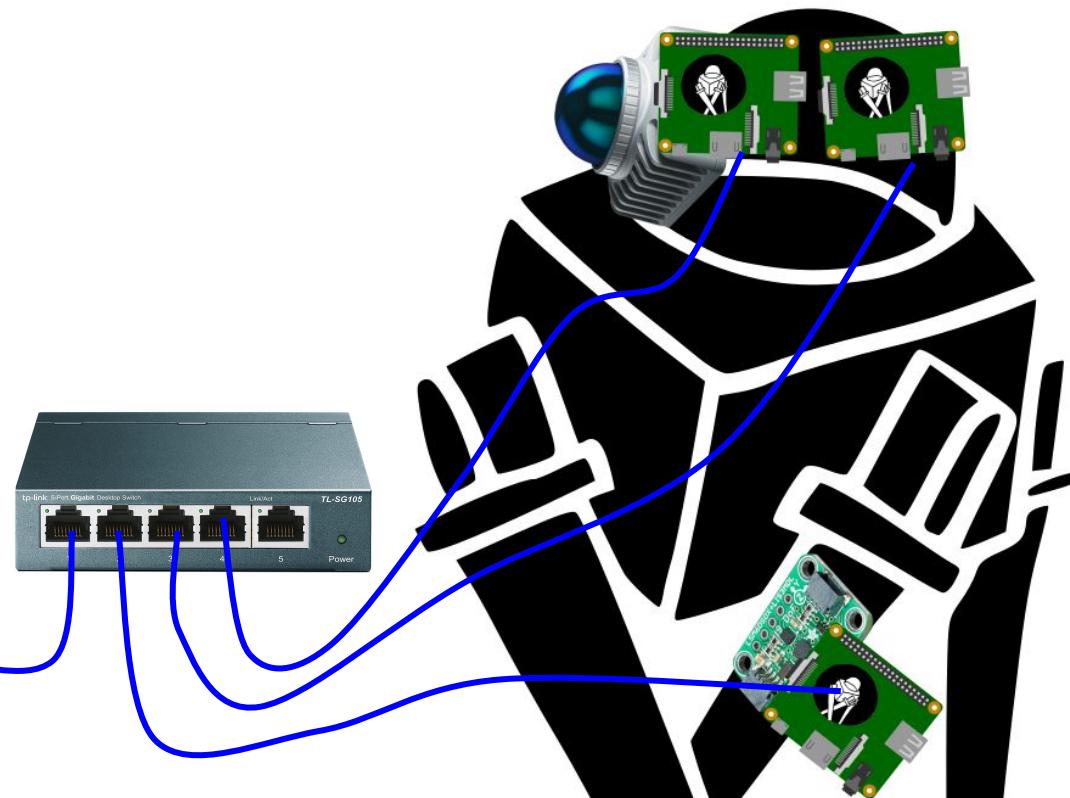
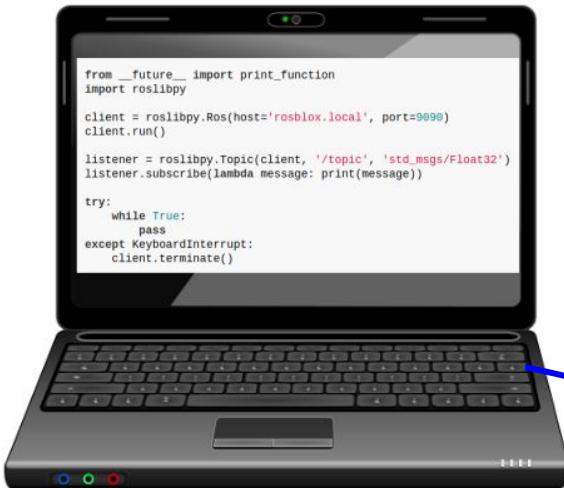
ROSbridge Server



ROSbloX

1. Plug-and-play connectivity
2. Integrated data visualization
3. **Modularity to extend**

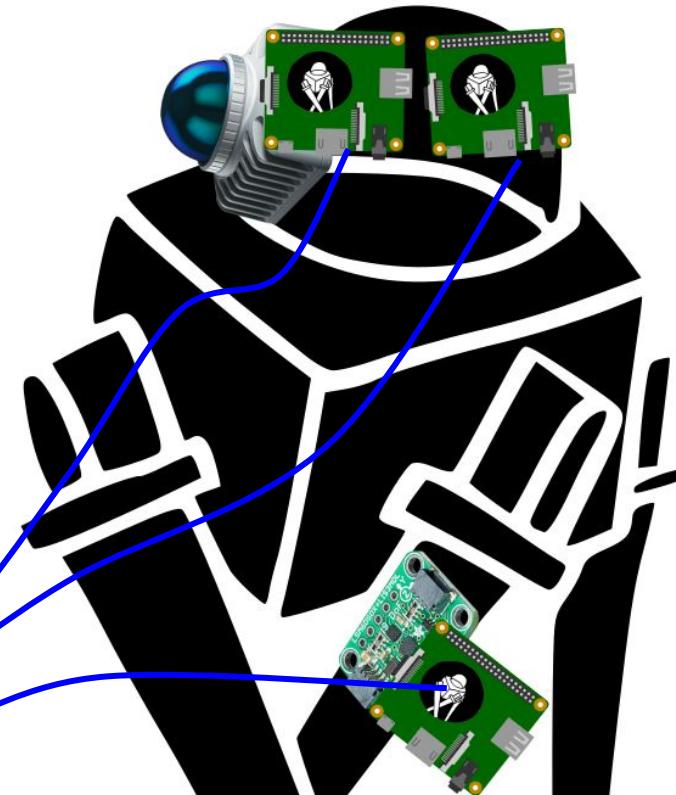
roslibpy
(ROS-independent
Python package)
+
ROSbridge Server



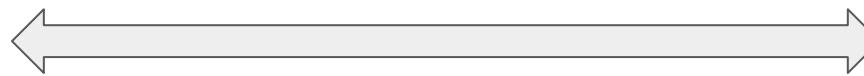
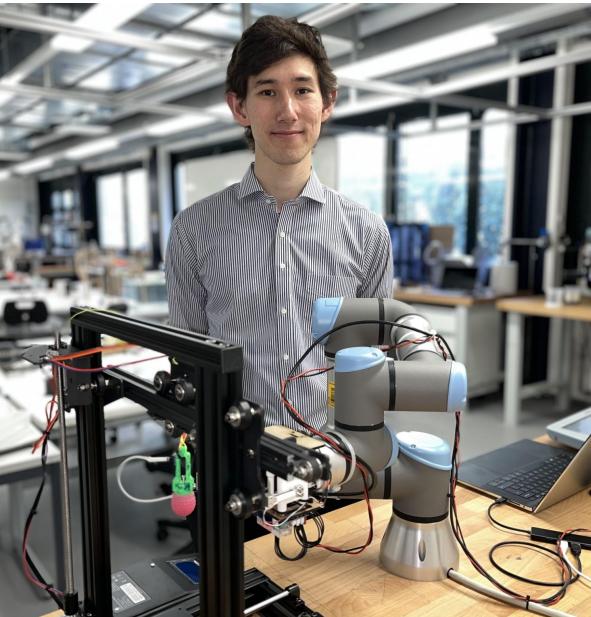
ROSbloX

1. Plug-and-play connectivity
2. Integrated data visualization
3. **Modularity to extend**

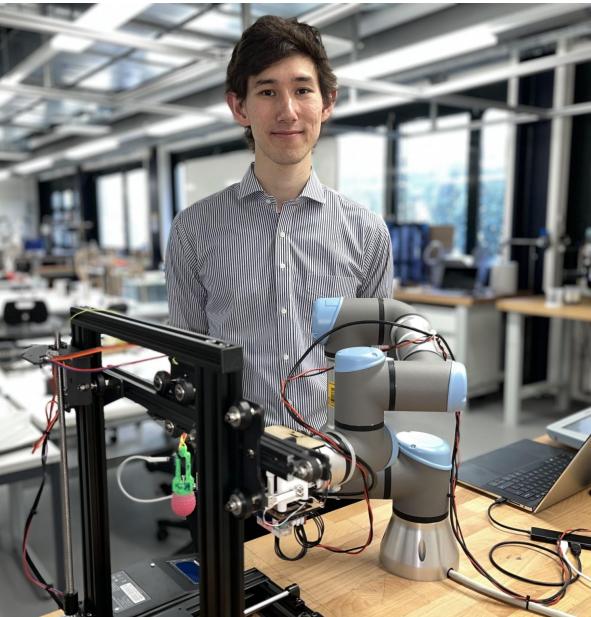
ROS2-native



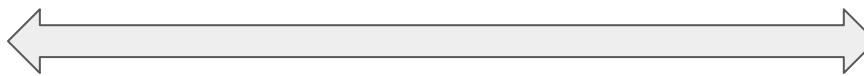
Kai is convinced and
wants a ROSbloX.



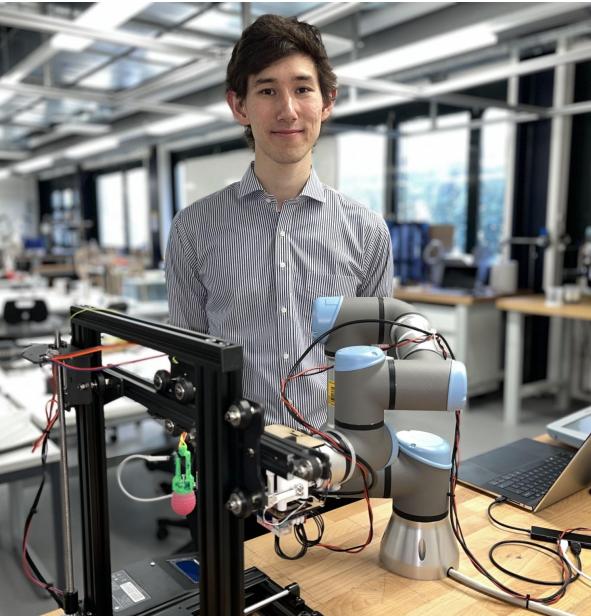
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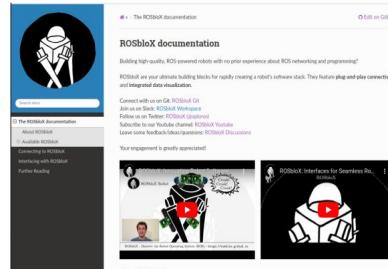
Hardware:



Kai is convinced and wants a ROSbloX.



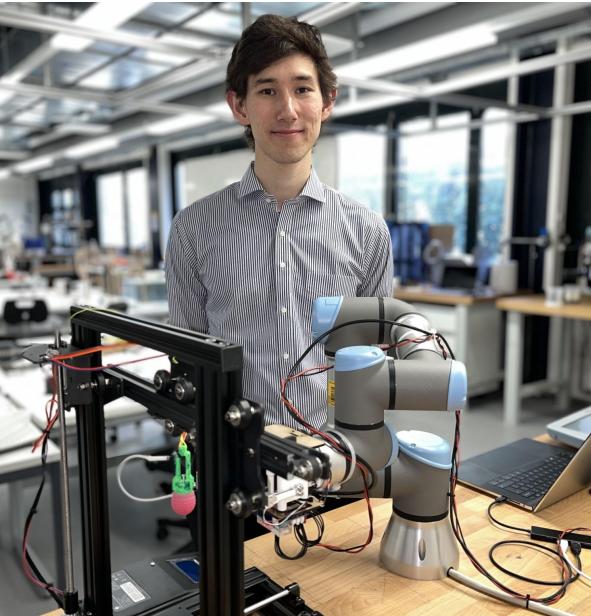
Software and Documentation:
<https://rosblox.github.io/>



Hardware:



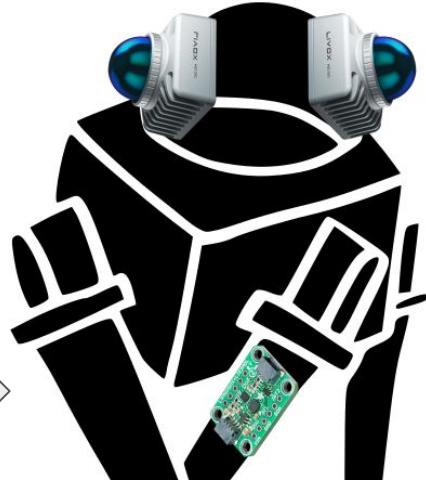
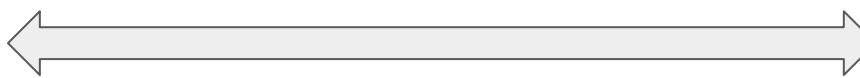
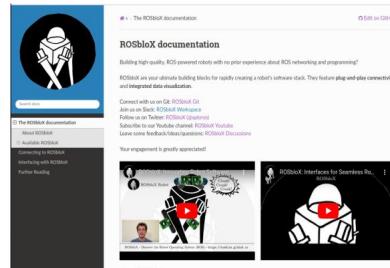
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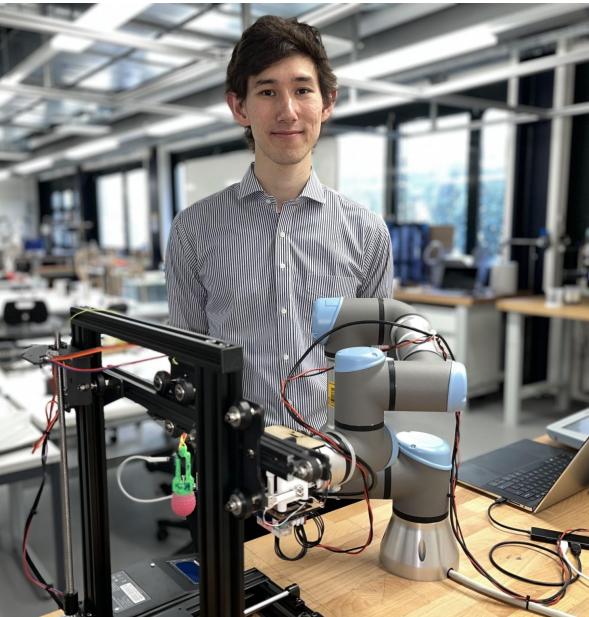
Hardware:



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Kai is convinced and wants a ROSbloX.



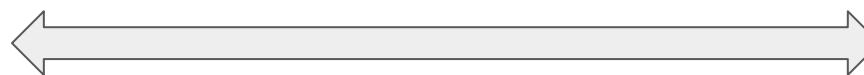
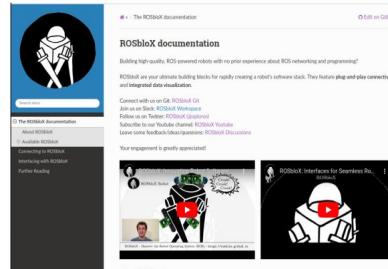
Community:
(e.g. ROSbloX Marketplace)



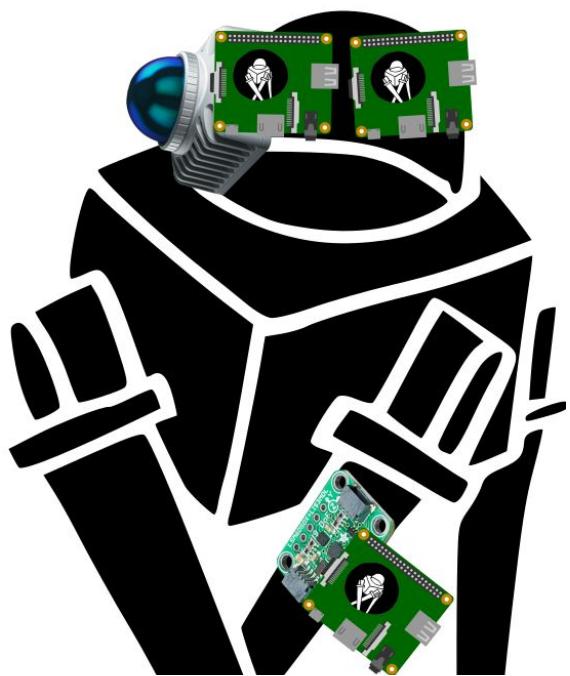
Hardware:



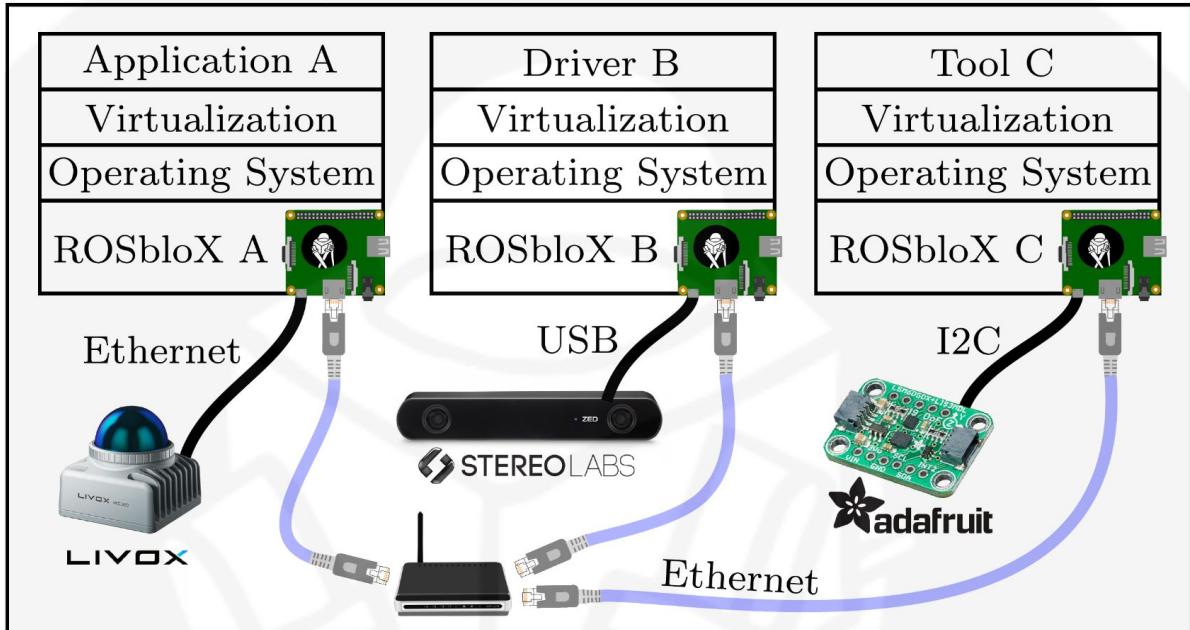
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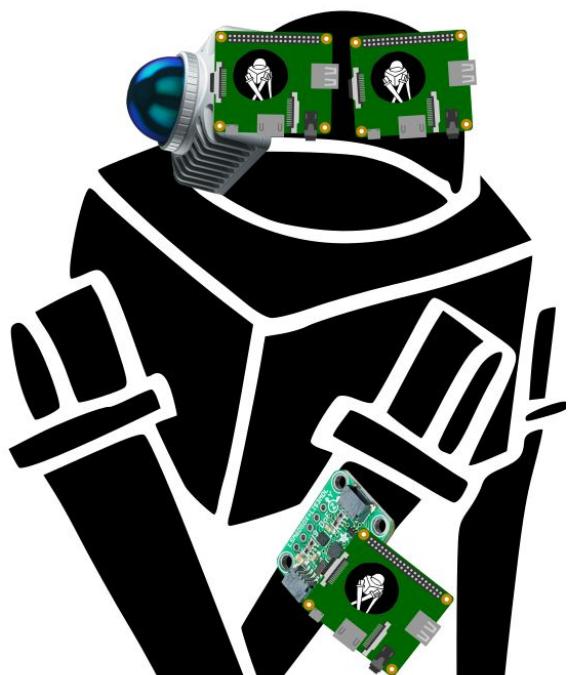
Great, we have a prototype.



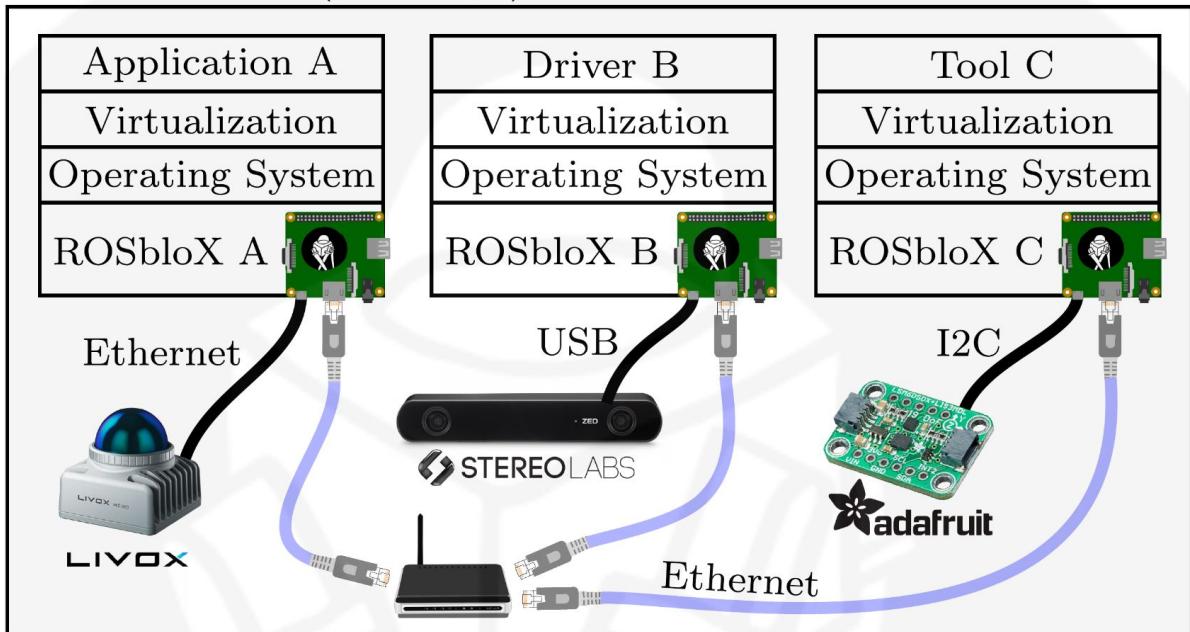
ROSbloX robot (prototype)



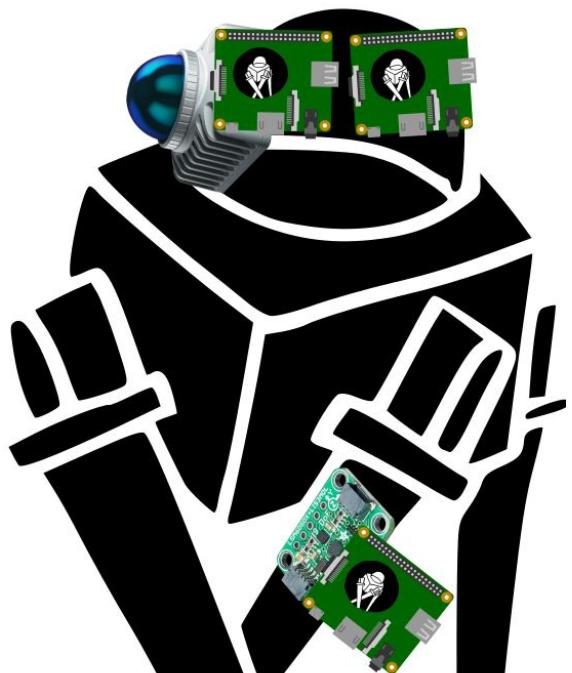
Great, we have a prototype. What next?



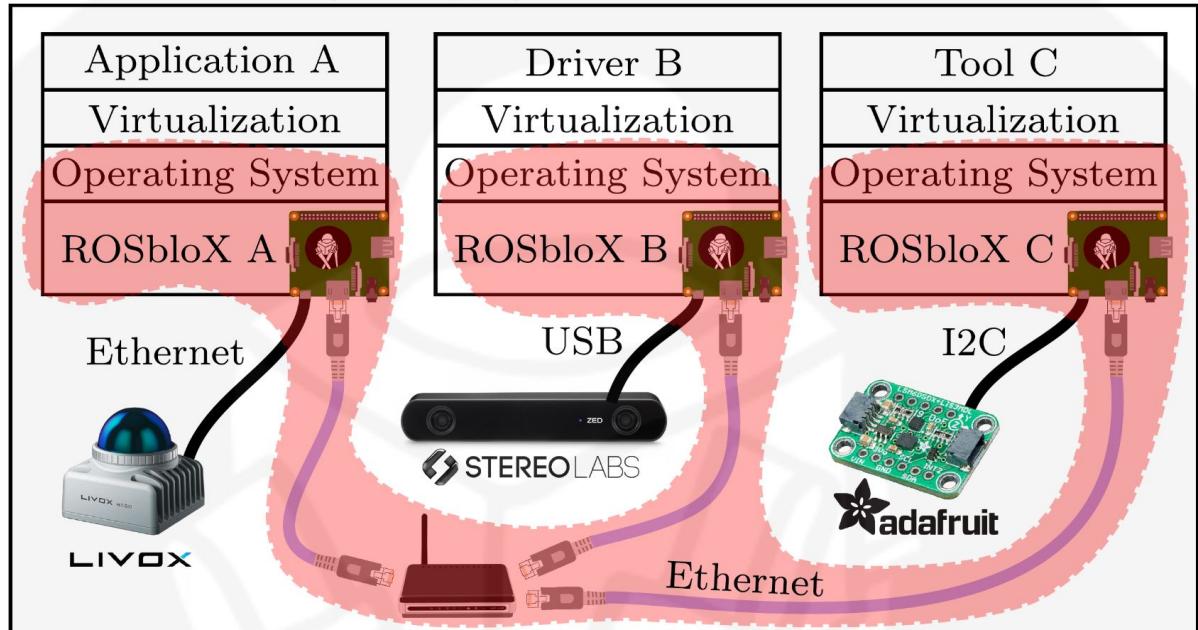
ROSbloX robot (prototype)



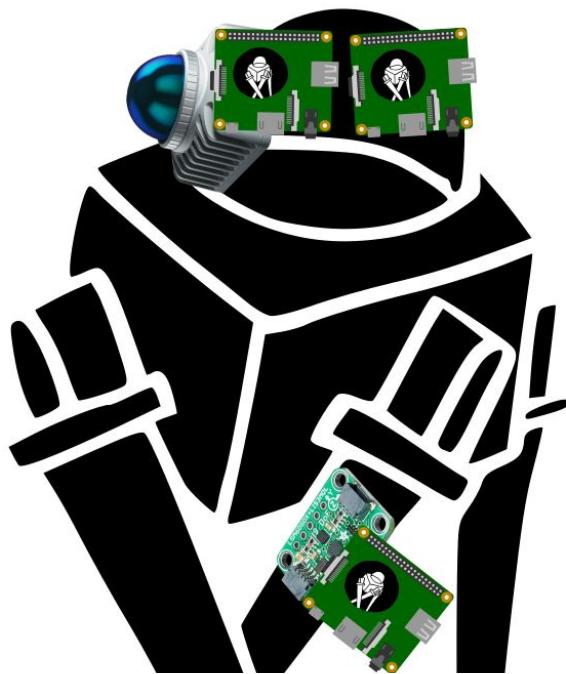
Great, we have a prototype. Computational Overhead



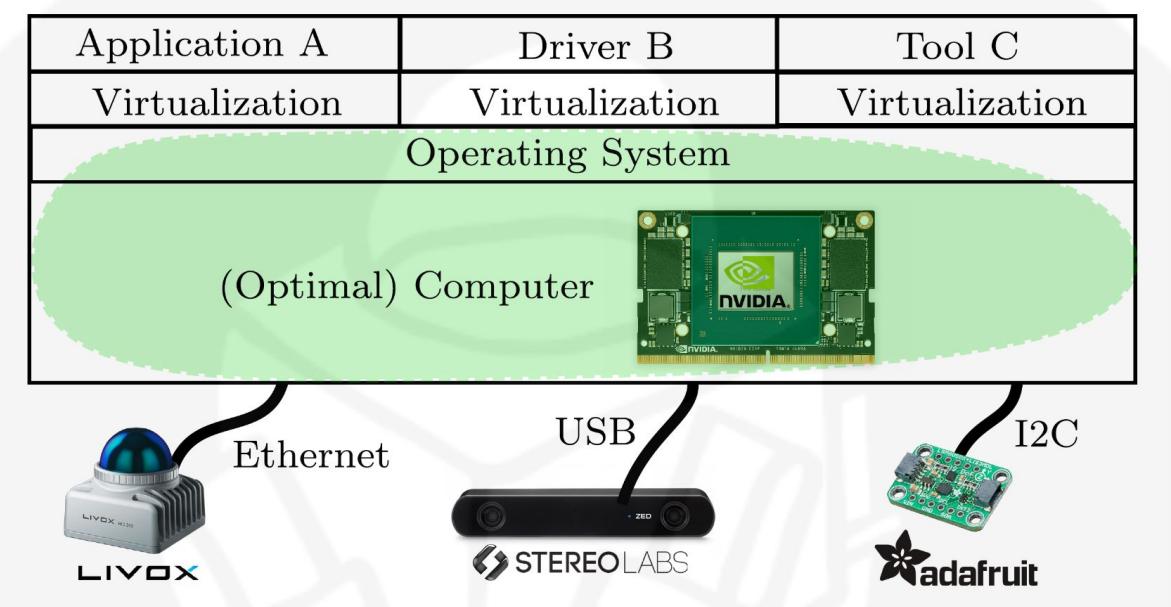
ROSbloX robot (prototype)



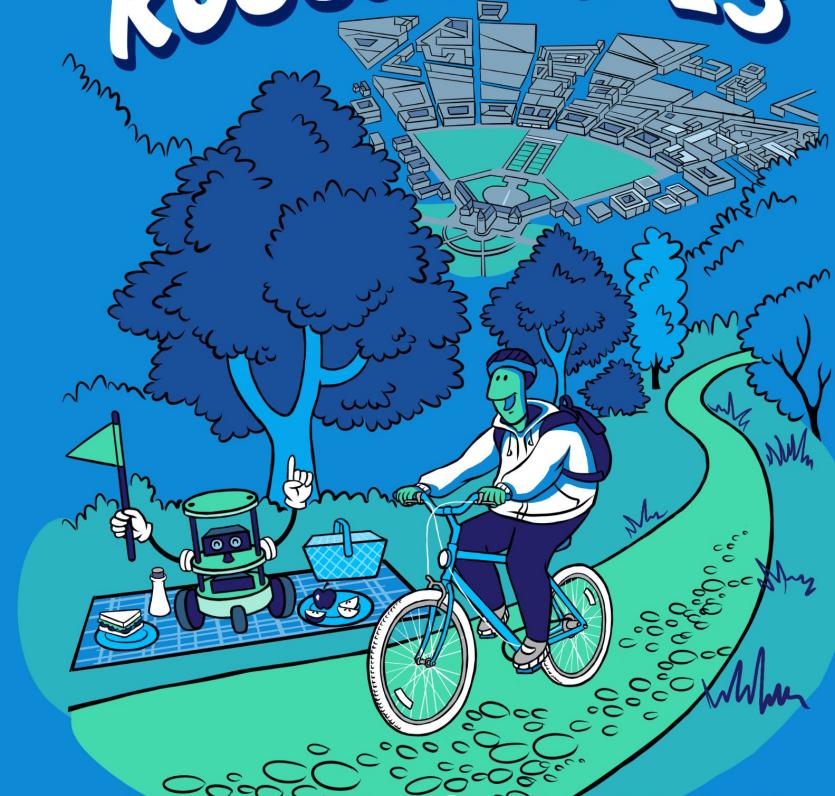
Great, we have a prototype. Application-optimal computing hardware



Modern (containerized) robot



ROSCon DE '23



KARLSRUHE

Thank you.

ROSbloX: Schnelleinstieg in hochwertige ROS-Robotik ohne Vorkenntnisse

Max Polzin

max.polzin@epfl.ch

24.11.2023

CREATE
Lab **EPFL**