

MASTER IN
COMPUTER
SCIENCE



UNIVERSITÉ DE FRIBOURG
UNIVERSITÄT FREIBURG

STEPHANOTRON

Final Presentation

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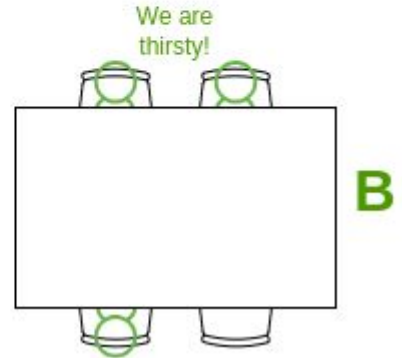
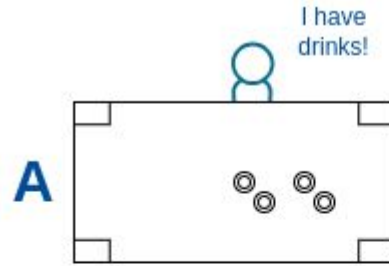
Project *Concept*

Industrial Concept

Robot is a “full” replacement for a server. It can pick up drinks, serve many customers to many tables, serve many drinks at a time, serve “fragile” drinks like cocktails, etc. The customers would have a touch screen with a easily expandable app that shows the options.

Prototype Concept

TIAGo Robot delivers **canned** drinks handed by the **bartender from the bar (A)** to point the **customers (B)**. The customer picks it up and sends the robot back to the bar.

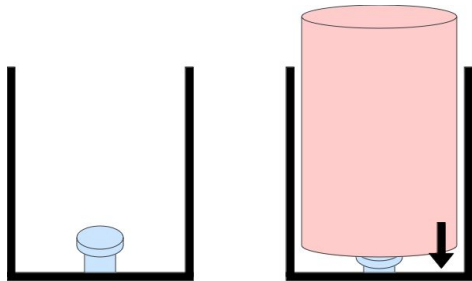


Project *Architecture*

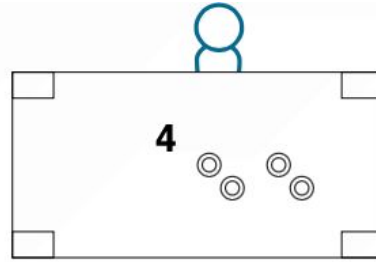
3



5



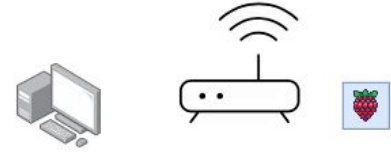
A



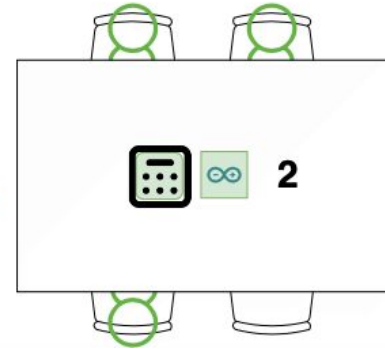
1



6



B



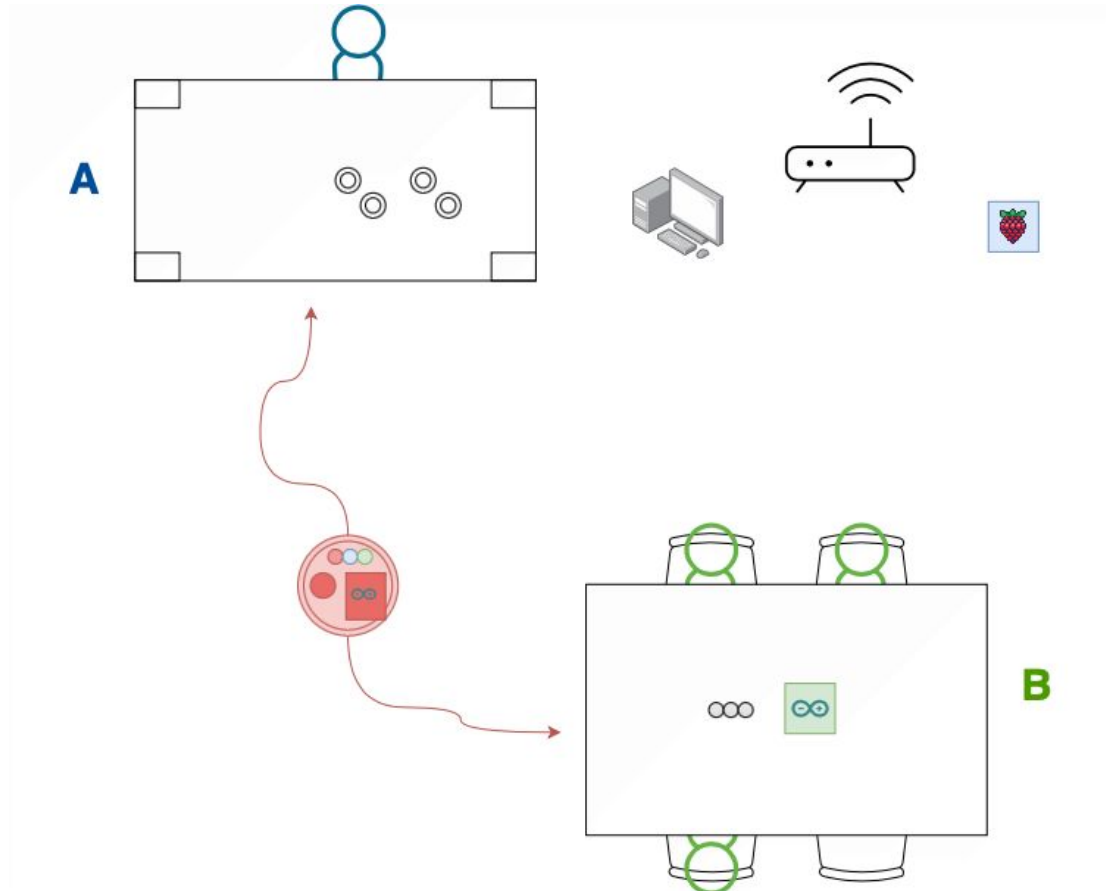
Project *Prototype*

Hardware:

- 1 x TIAGo
- 2 x Arduino and Sensors/Cables/etc.
- 1 x RaspberryPi
- 1 x Ubuntu 20.04 LTS Client/Server
- 1 x Prusa 3D Printer

Software:

- MQTT (Docker, Docker Compose)
- Node Red
- PrusaSlicer and OpenSCAD



Project *Communications*

Topics:

1.) TIAGo

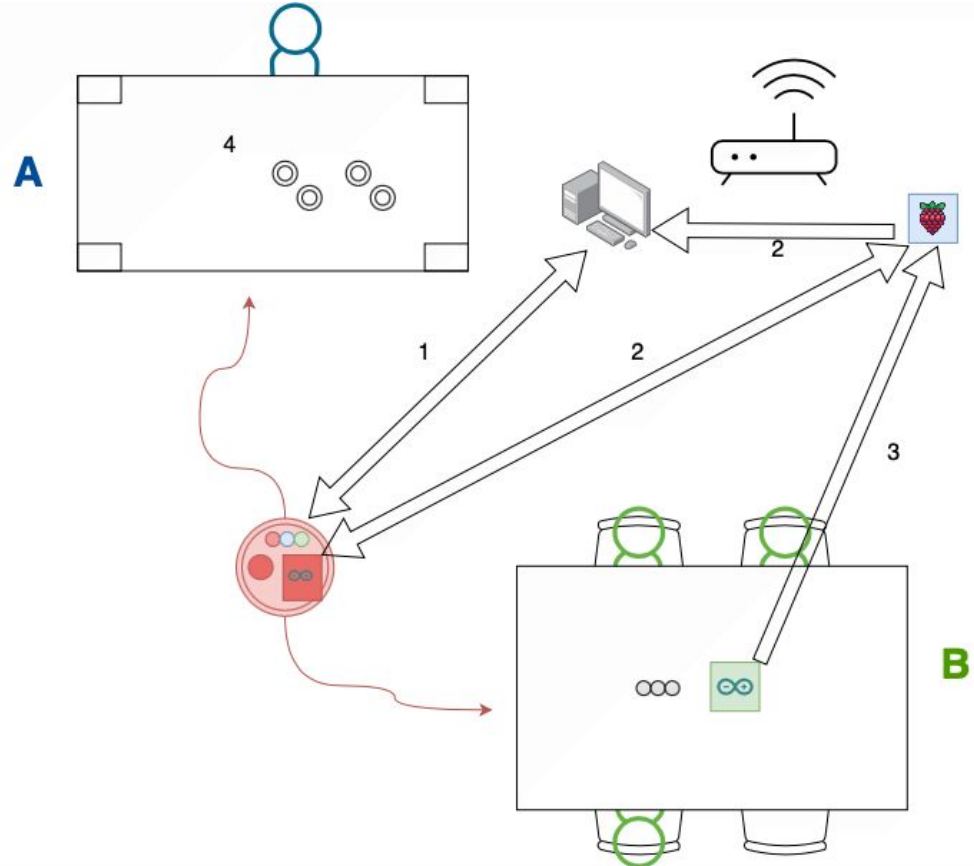
- Publish: `/amcl_pos`
- Subscribe: `/move_base_simple/goal`

2.) TIAGo Arduino

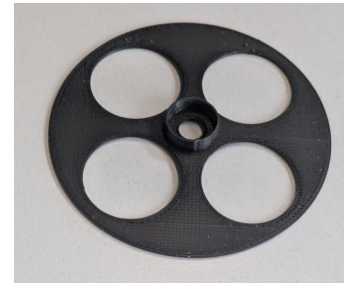
- Publish: `/order/status`
- Subscribe: `/customer/drink`

3.) Customer Arduino

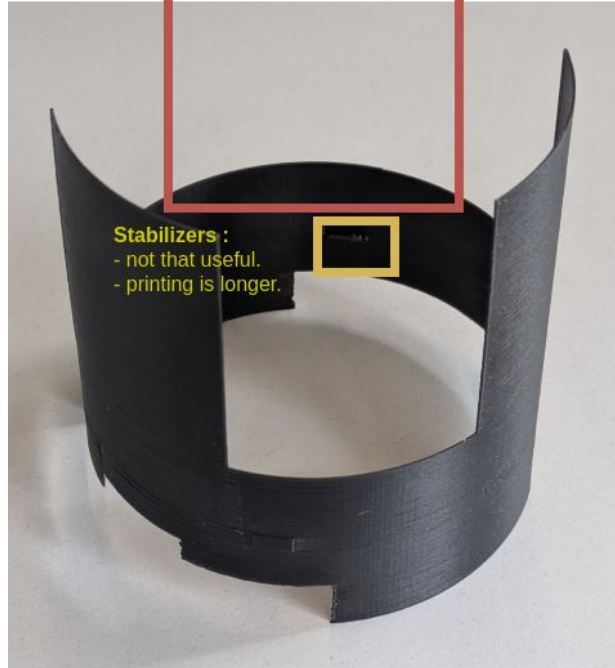
- Publish: `/customer/drink`
- Subscribe: Currently None



Current Work *3D-Printing*



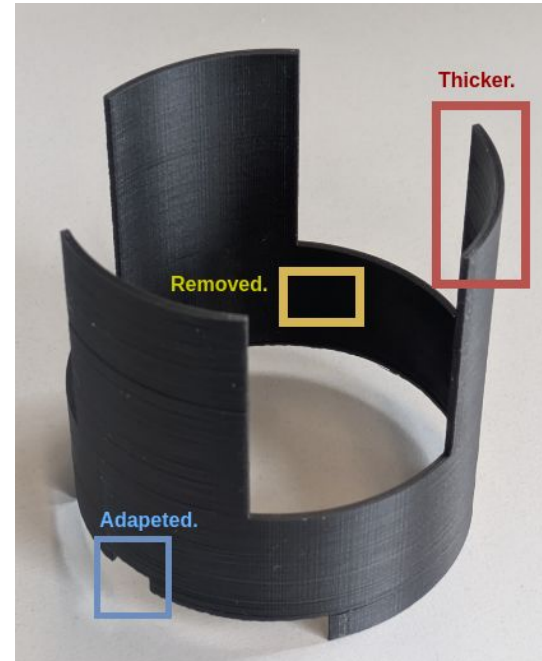
V2



Thickness too thin :
- the holder boke.
- the can is unstable

Stabilizers :
- not that useful.
- printing is longer.

V3

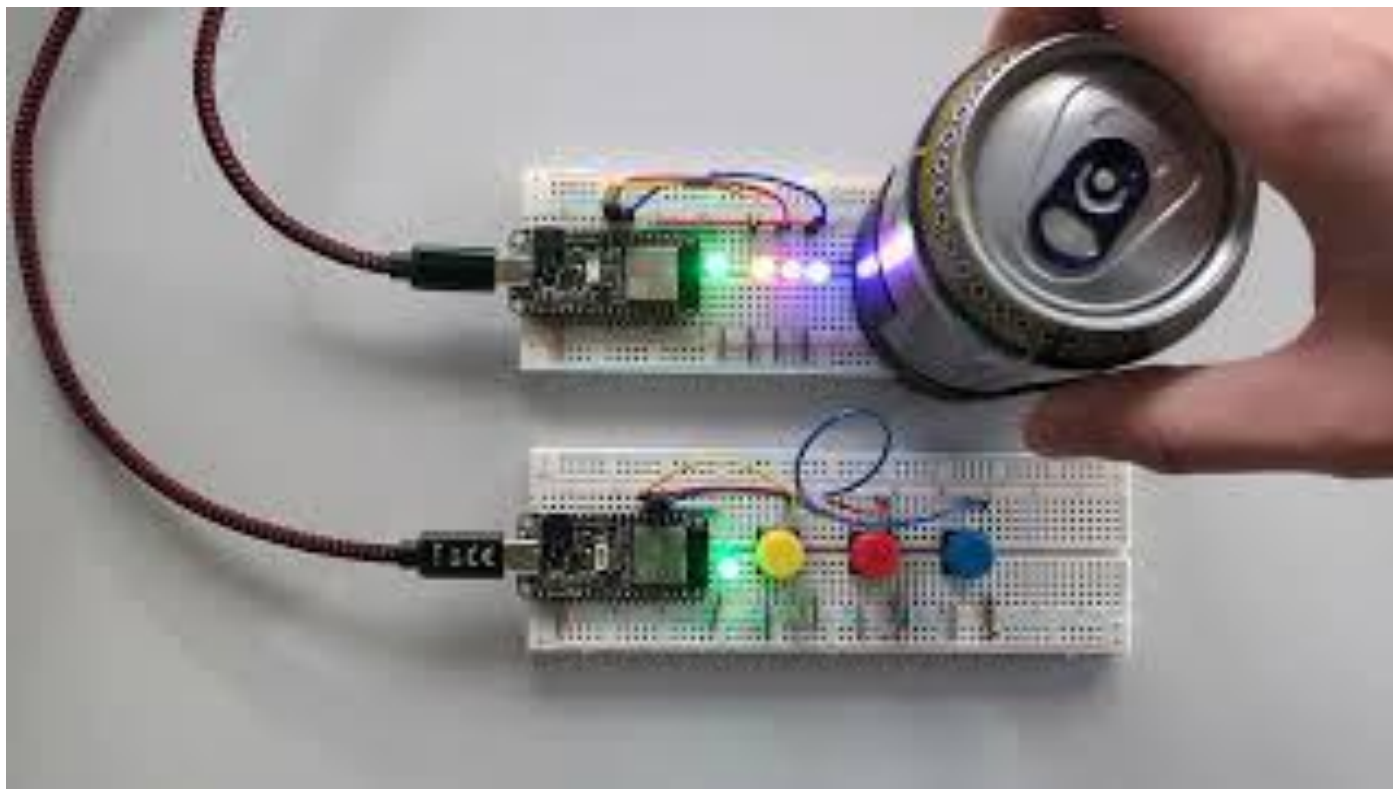


Thicker.

Removed.

Adapeted.

Current Work *Demo*



Future Work *Limitations and Challenges*

- TIAGo is bound to the ground
- TIAGo should be more easily accessible for the customer
- TIAGo doesn't look friendly
- TIAGo Add-Ons should be more stable
- User interface should be more interactive and have status updates
- Increase security of communications (privacy, integrity, redundancy, robustness)
- Replace Node RED with scalable system (Cloud, Kubernetes)