

# TIFA

TEL-U INTERACTIVE FOOD ASSISTANT

## Meet TIFA – The Autonomous Waiter Robot!

TIFA Robot Waiters are robotic systems designed to transform and elevate human tasks in service environments. With key features such as SLAM (Simultaneous Localization and Mapping) and auto-charging, TIFA is designed to revolutionize efficiency and enhance customer experiences. Although still in development, these robots represent the future of automation in cafes, restaurants, and more, by delivering efficient service.



The increase in sales volume directly influences ROI by boosting the revenue generated from the initial investment.

The use of robot waiters can support approximately 70% of operational service tasks

The presence of these robots can increase customer numbers by 20-30%



Report  
pengembangan  
T.I.F.A  
(06/11/2024)



## Objective Pembahasan :

1. Proof of concept (done)
2. Proof of concept (process)
3. Result Progres
4. Program Matrikulasi Teknis

## **Update :**

1. Robot System
2. Metode Kinematik and Environment Learning
3. Result proof of concept

## **Goal :**

1. Obstacle Avoidance
2. Looks Robot
3. Lifetime robot
4. Mapping

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## **Proof of Concept (done)**

1. Serial communication between Micro
2. Mapping from Lidar
3. ERD database
4. Application interface

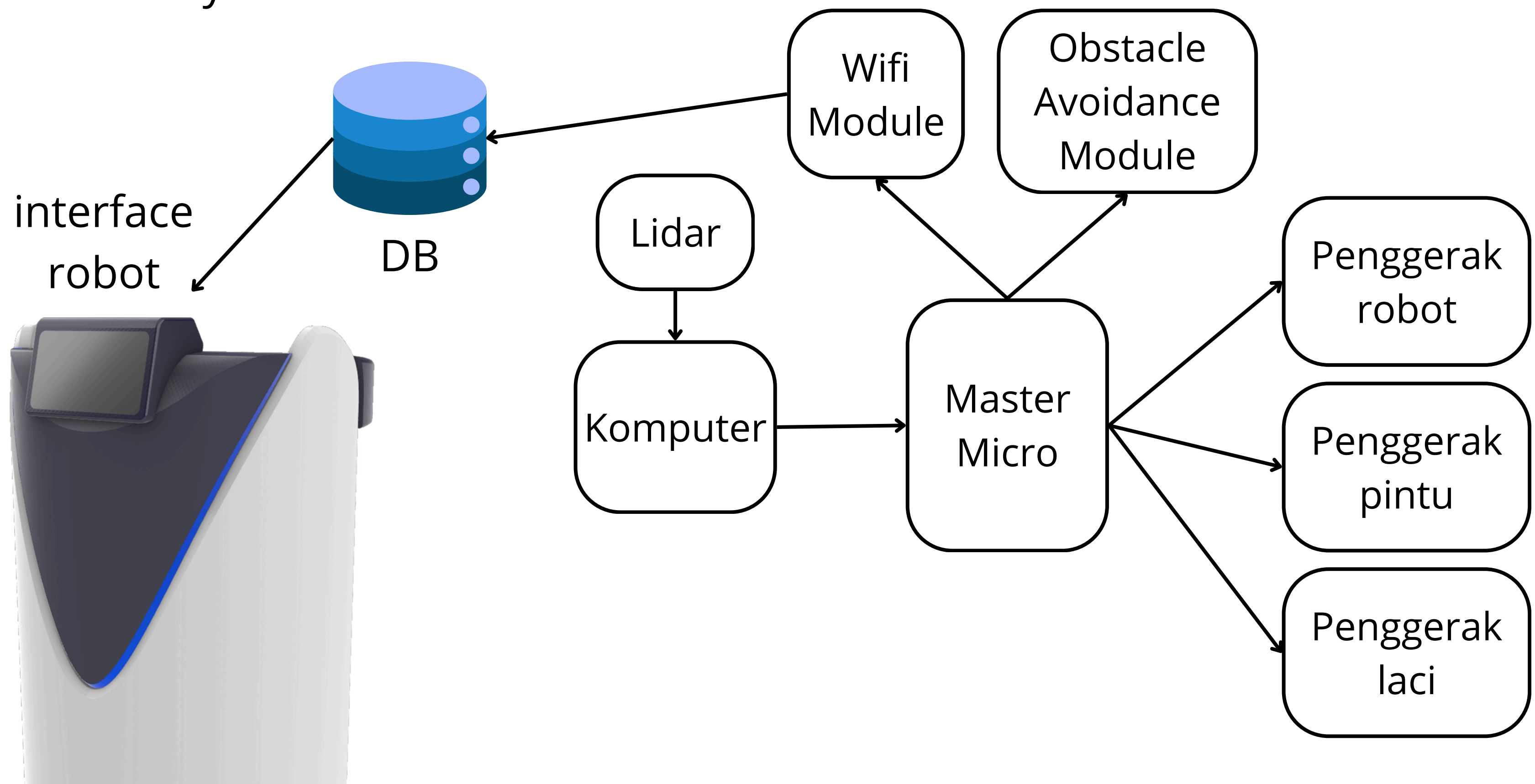
## **Proof of Concept (process)**

1. Printing Prototype robot design 1:1 Scale
2. Update Algorithm Kinematics robot
3. TF library & Kalman Filter

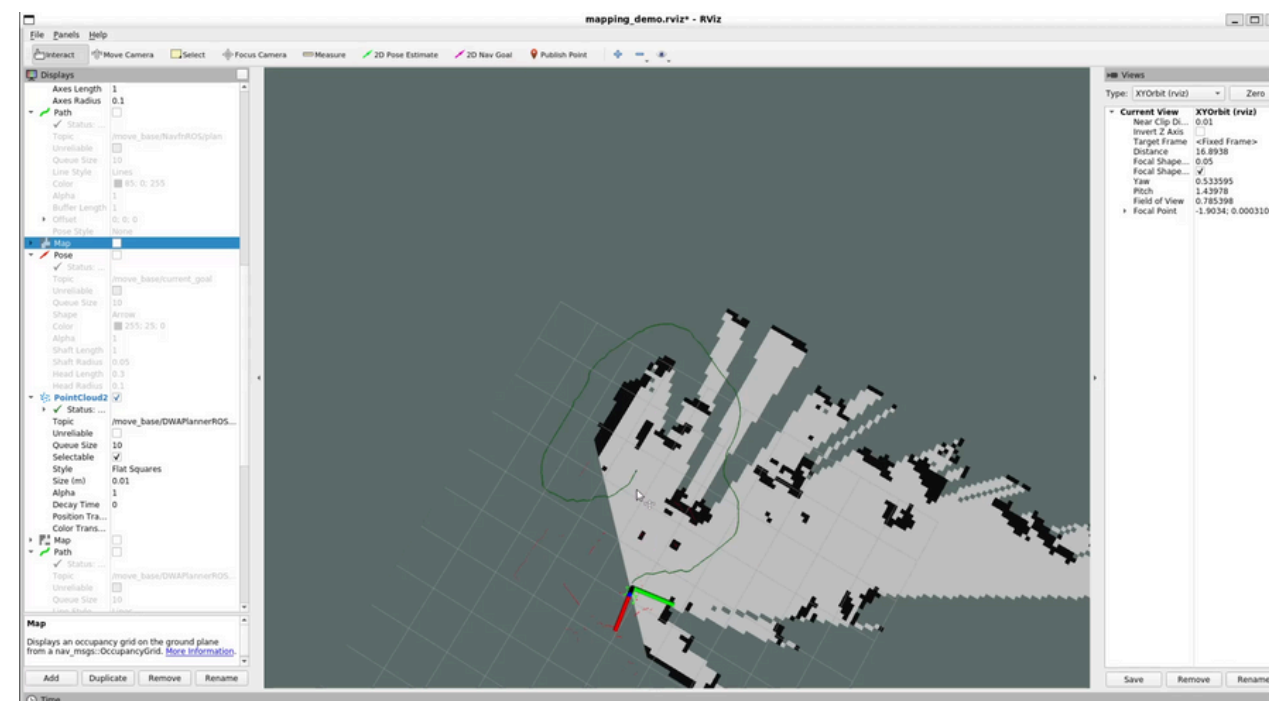
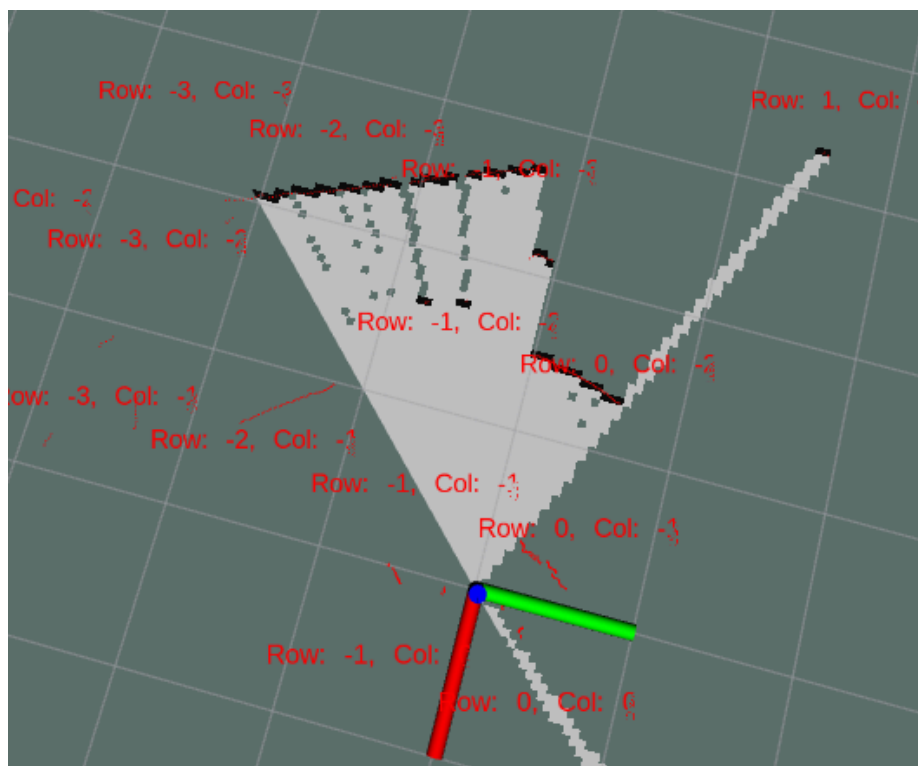
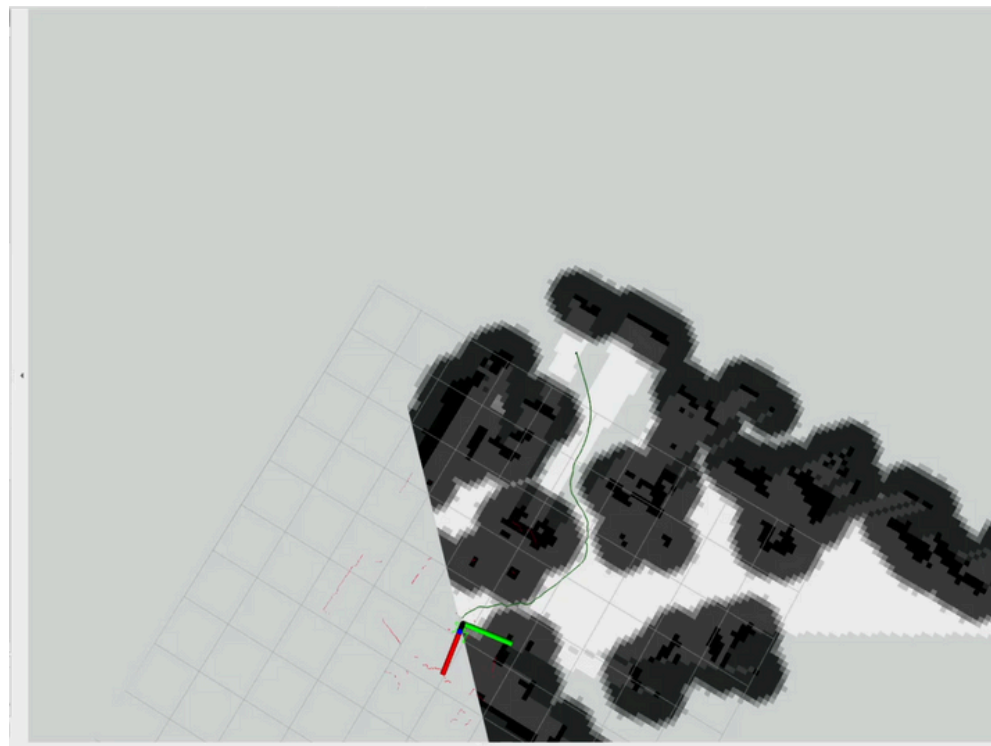
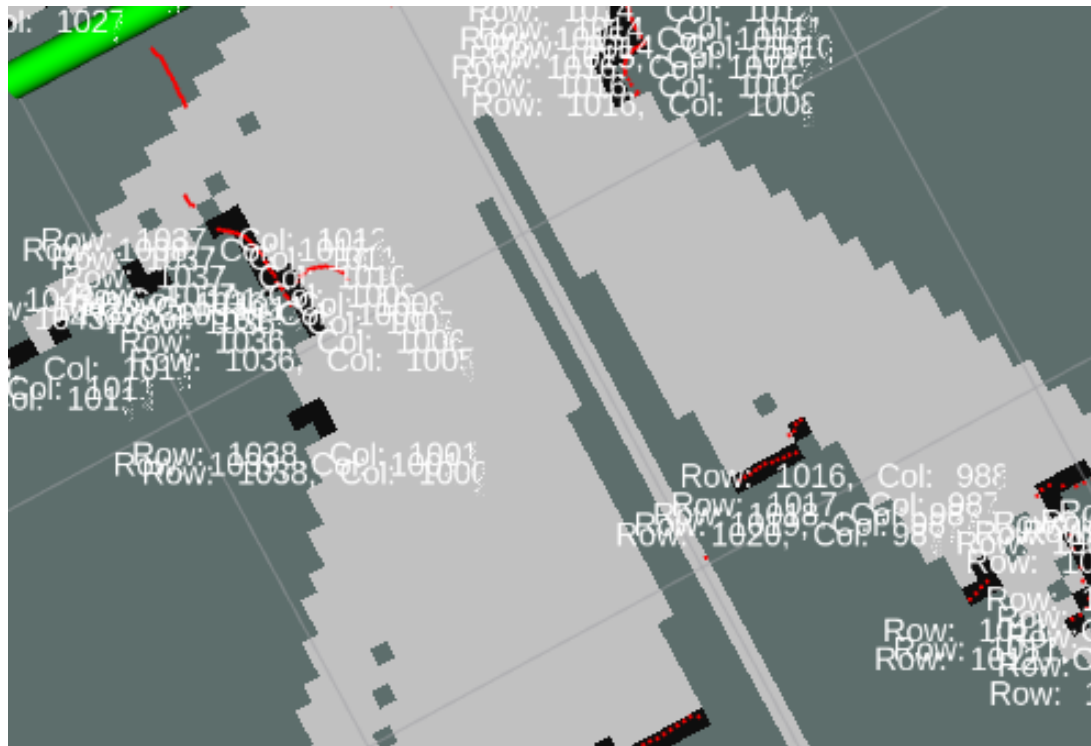
robot baru mencapai **30%** pengembangan berdasarkan semua metode yang sudah di coba (yang gagal dan berhasil)

# Serial Communication between micro solution

!new system



**Mapping** kami improve untuk meningkatkan performa pergerakan robot supaya lebih mulus. dengan menggunakan sensor lidar mapping dapat dilakukan secara otomatis.



**ERD** (Entity Relationship Diagram) database dibuat untuk mengatur data flow dari interface (yang akan ditampilkan untuk user) dan data yang akan digunakan oleh robot dalam pergerakan dan melayani.

localhost / 127.0.0.1 / robot\_kafe

Robot Kafe

127.0.0.1:5000

### Pesanan Robot Kafe

Nomor Meja

Kirim Pesanan

Daftar Pesanan

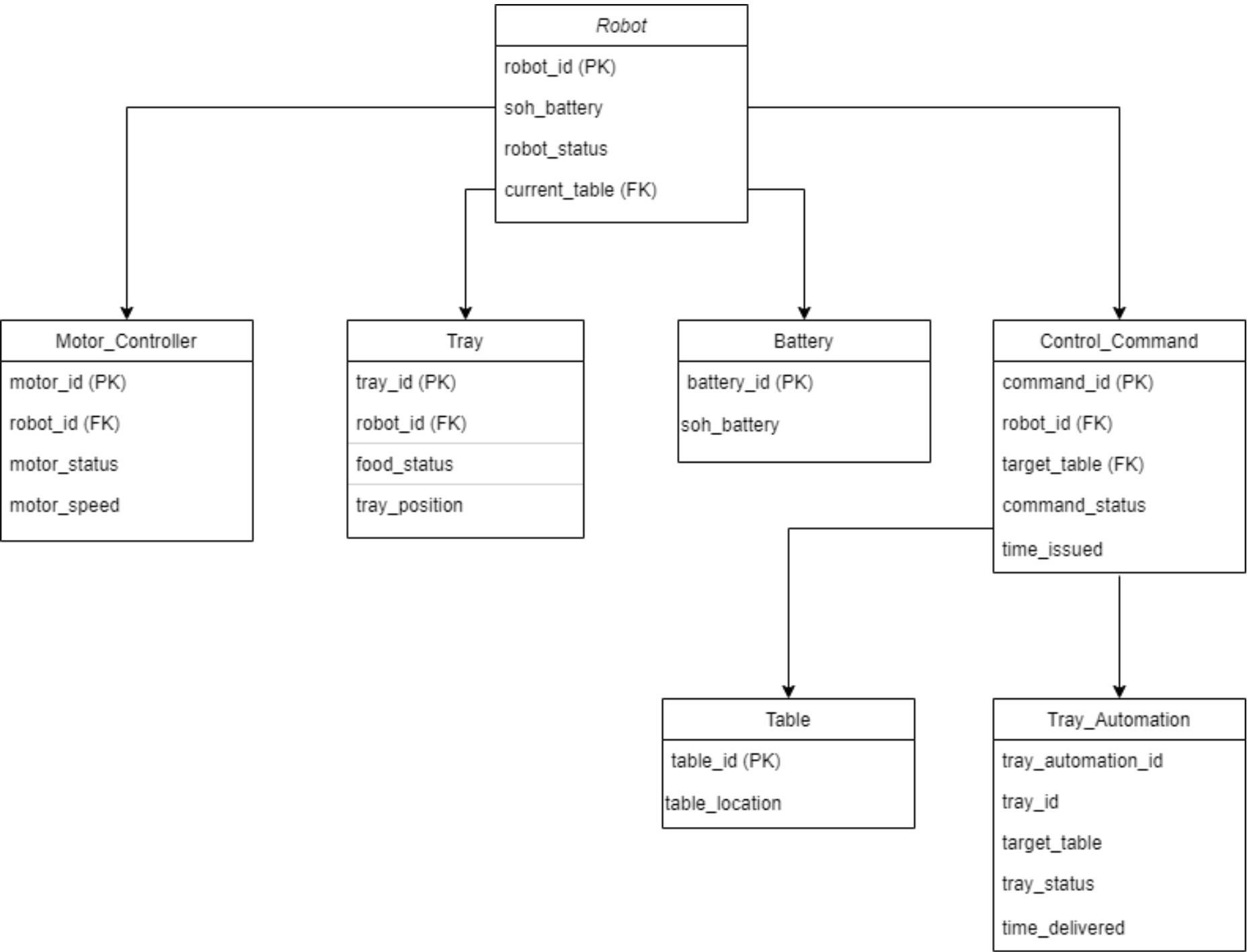
ID	Meja	Posisi Awal	Posisi Akhir	Jarak (m)	Rotasi Roda
1	2	(0.0, 0.0)	(5.0, 7.0)	8.6	10.95
2	8	(5.0, 7.0)	(3.0, 1.0)	6.32	8.05
3	1	(3.0, 1.0)	(2.0, 3.0)	2.24	2.85
4	2	(2.0, 3.0)	(5.0, 7.0)	5.0	6.37
5	5	(5.0, 7.0)	(1.0, 9.0)	4.47	5.69

RCC - GET

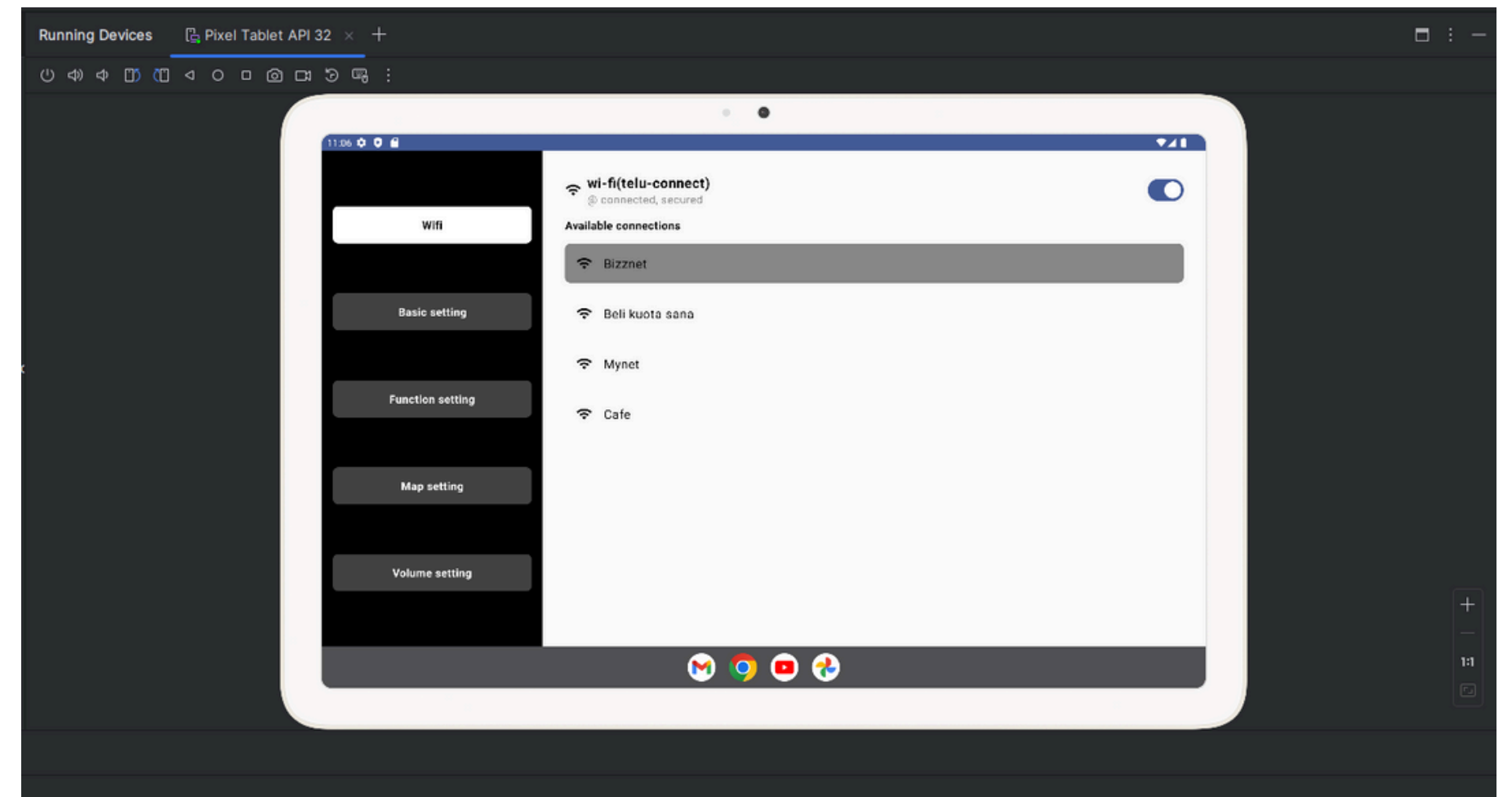
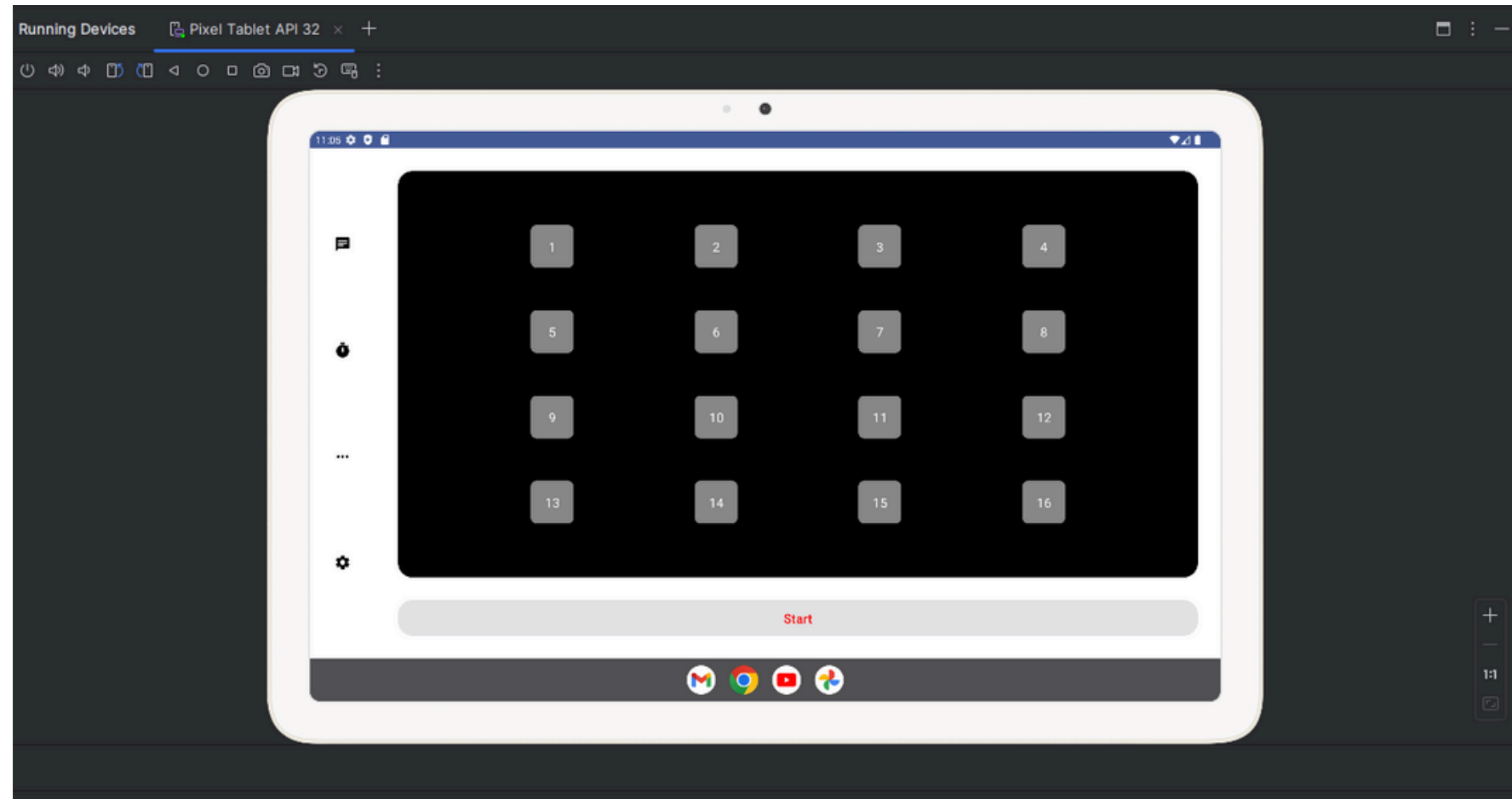
Skor pertanding...

15:04

05/11/2024

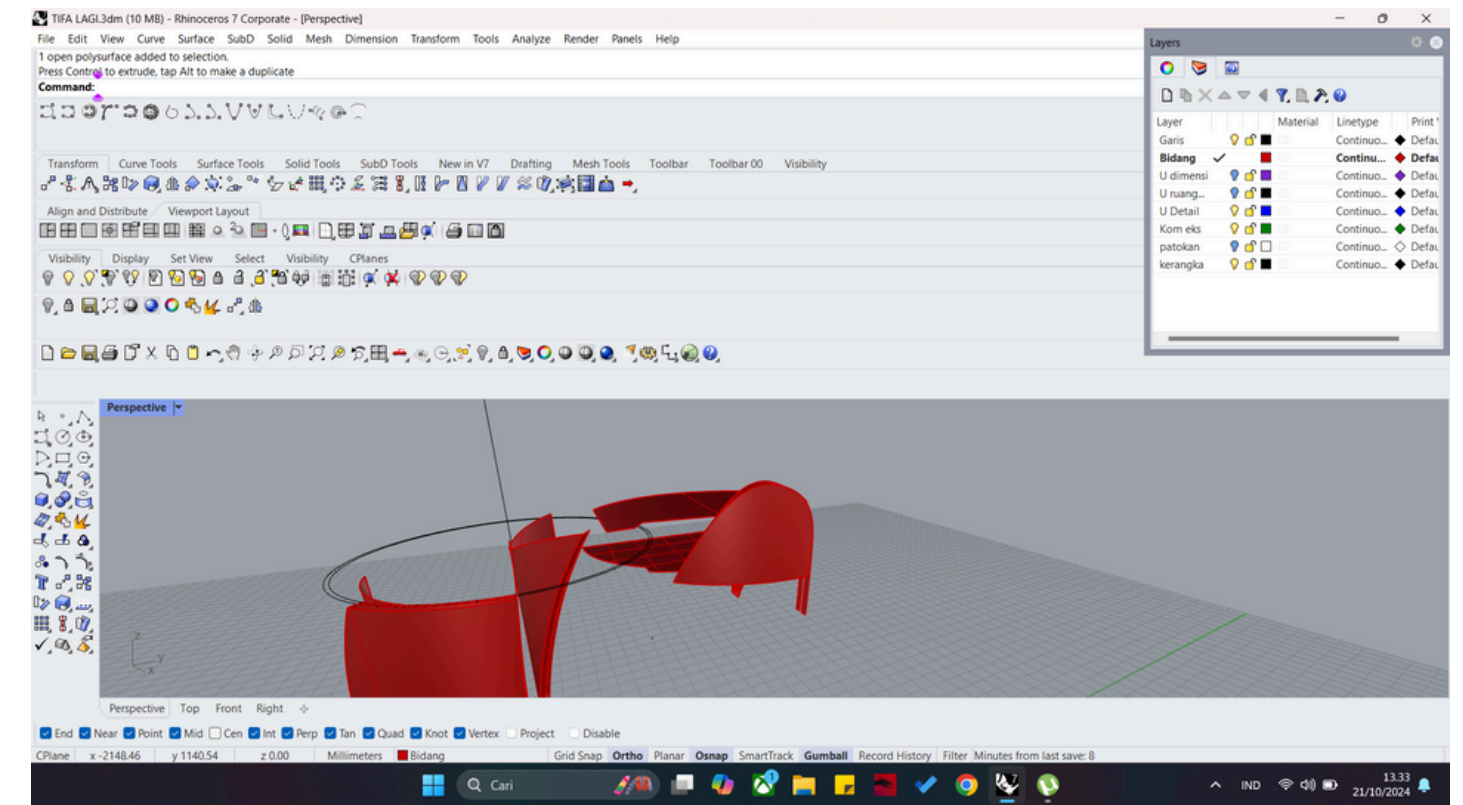
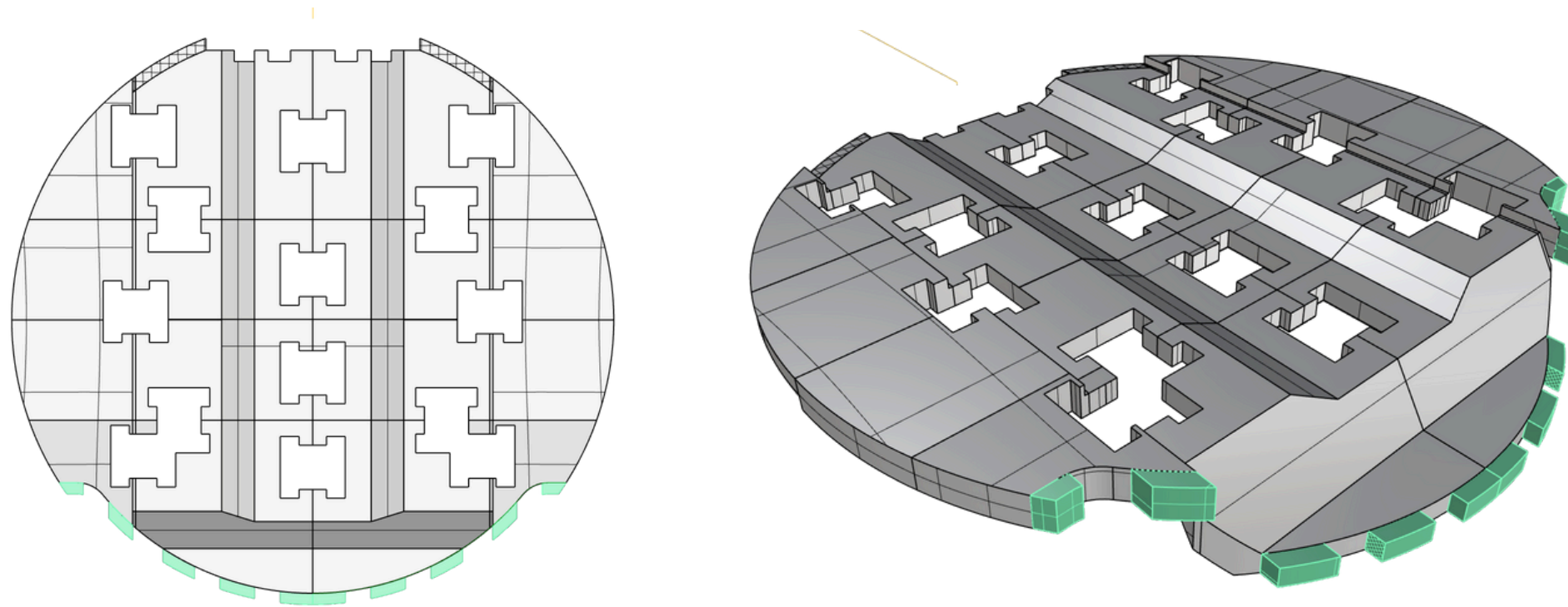


**Application Interface**, interface untuk menampilkan data dari database untuk user.





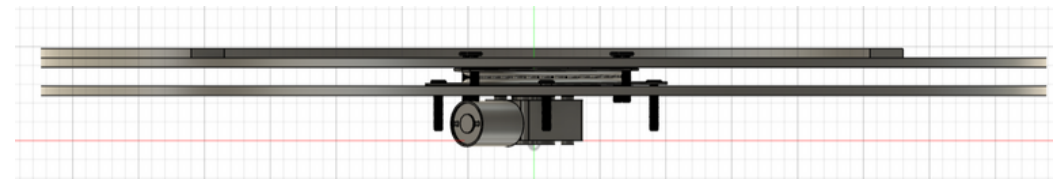
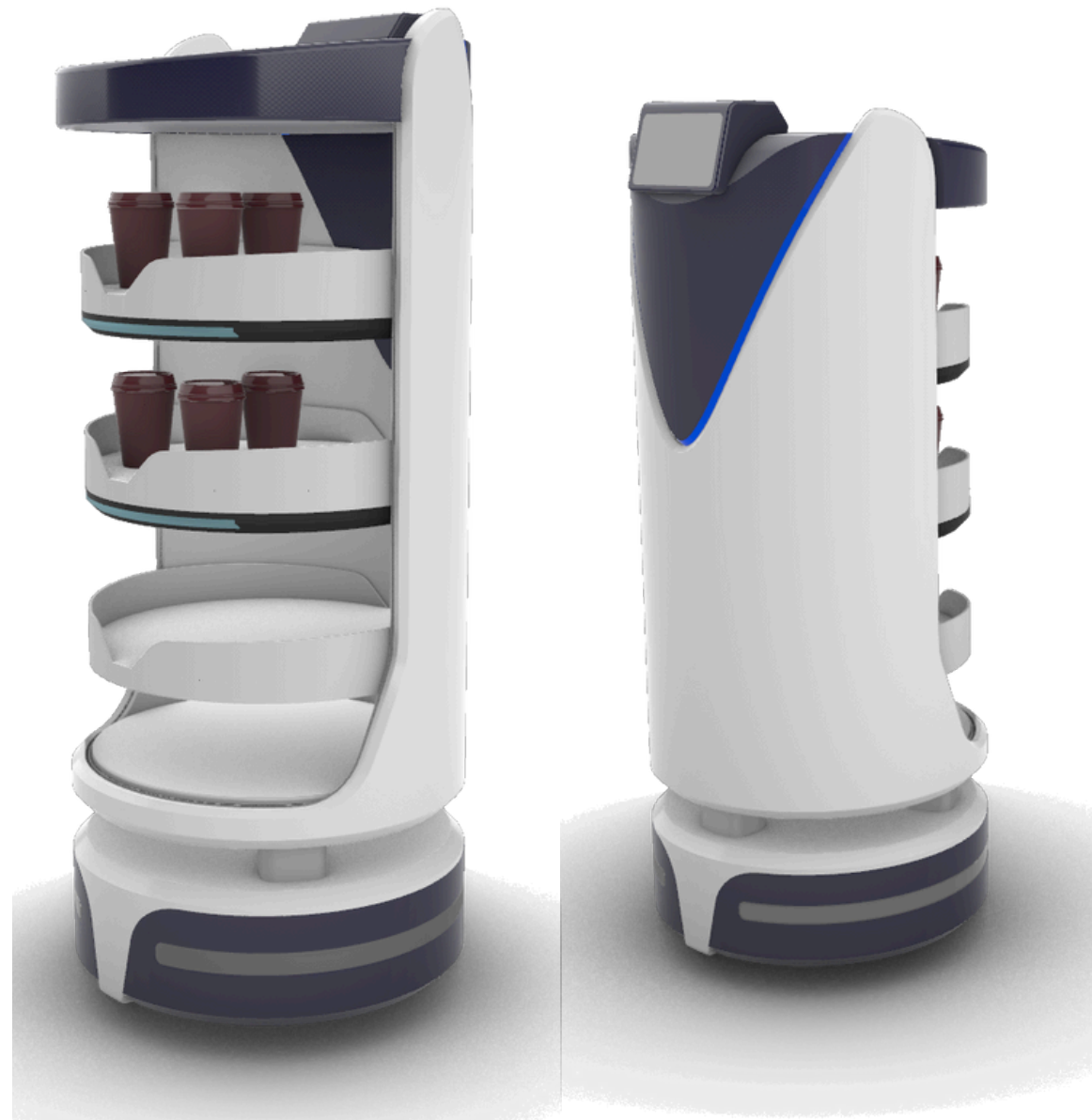
Berikut beberapa proof of concept yang masih di tahap pengerjaan saat ini:



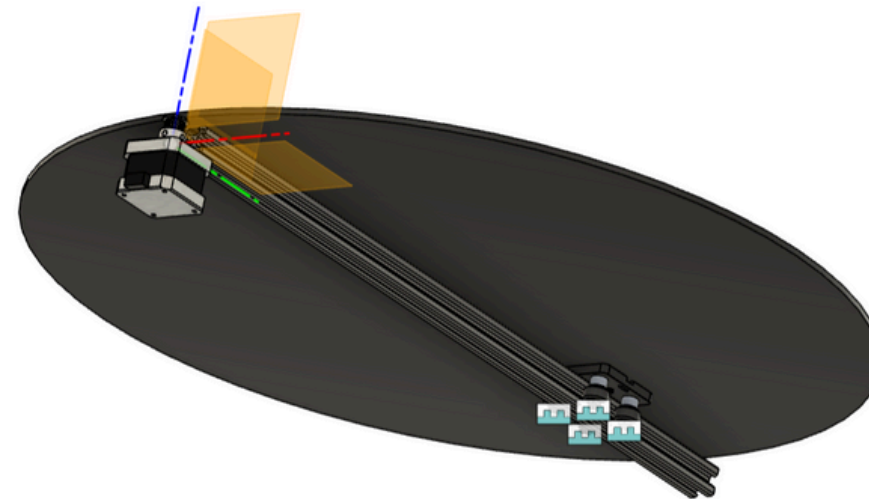
tahap ini kami membuat cetakan dengan mesin 3D print untuk manufaktur body robot, selain itu kami juga masih dalam tahap riset terkait kinematik dan filtering untuk motion robot.



## RESULT PROGRES :



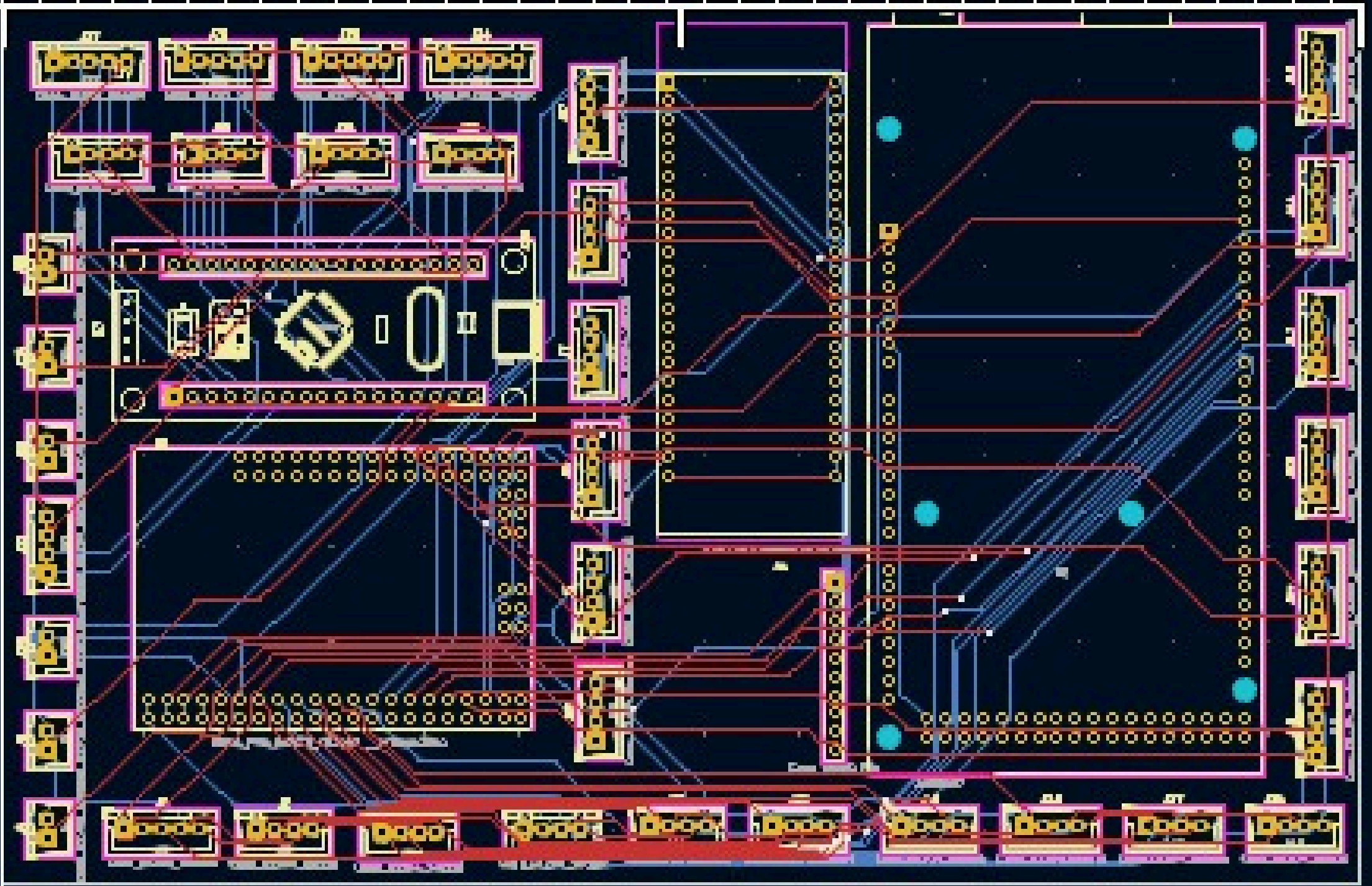
mekanisme pintu



mekanisme tray



180,000  
170,000  
160,000  
150,000  
140,000  
130,000  
120,000  
110,000  
100,000  
90,000  
80,000  
70,000  
60,000  
50,000  
40,000  
30,000  
20,000  
10,000  
0,000



x: 184,150 mm  
y: 0,000 mm  
r: 184,150 mm  
θ: -0,0°

## **Program Matrikulasi Teknis**

Matrikulasi teknis kami berikan untuk pembekalan tim dalam pengerjaan robot, sehingga tim memiliki banyak waktu dalam melakukan riset hal baru. tim teknis tidak perlu melakukan riset yang sudah dilakukan karena semua itu akan di berikan di matrikulasi teknis oleh kami.

1. Kinematika dasar : robot 2 roda differential kinematik
2. Kontrol dasar : PID for mobile robot
3. Kinematika dan Kontrol



# List Sponsor

No	Nama Perusahaan	Deskripsi	Status	Contact
1	Mandiri Capital Indonesia	Support Financial	On Progress	<a href="mailto:info@mandiri-capital.co.id">info@mandiri-capital.co.id</a>
2	Telkom Indonesia	Membantu infrastruktur IoT seperti penggunaan WiFi	On Progress	<a href="mailto:info.partner@telkom.co.id">info.partner@telkom.co.id</a>
3	PT. LEN Industri	Support Financial	Not Yet	<a href="mailto:komunikasi.korporasi@len.co.id">komunikasi.korporasi@len.co.id</a>
4	Gojek	Support Financial	Not Yet	<a href="https://www.gojek.com/en-id/our-location">https://www.gojek.com/en-id/our-location</a>
5	Samsung Indonesia	Support Device	Not Yet	<a href="https://www.samsung.com/id/support/contact/">https://www.samsung.com/id/support/contact/</a>
6	Huawei	Membantu infrastruktur IoT seperti penggunaan WiFi	Not Yet	<a href="https://consumer.huawei.com/id/support/contact-us/email-us/">https://consumer.huawei.com/id/support/contact-us/email-us/</a>
7	Astra	Support Financial	Not Yet	<a href="mailto:corcomm@ai.astra.co.id">corcomm@ai.astra.co.id</a>
8	Yaskawa	Support Financial	Not Yet	<a href="https://www.yaskawa.co.id/contact-us/">https://www.yaskawa.co.id/contact-us/</a>
9	Pertamina	Support Financial	Not Yet	<a href="mailto:pcc135@pertamina.com">pcc135@pertamina.com</a>
10	Advan	Support Device	Not Yet	<a href="mailto:contact@info.com">contact@info.com</a>
11	Artratonics	Sensor (LiDAR A2)	Done	
12	ABC	Support baterai	Not Yet	<a href="https://abcpresident.com/id/contact">https://abcpresident.com/id/contact</a>
13	ABB	Support Financial	Not Yet	<a href="mailto:contact.center@id.abb.com">contact.center@id.abb.com</a>

Terima Kasih🙏🙏🙏