

# Automated Delivery Robots as a Service



From Research to a Startup



# Introduction: About me



**Nwadiuto Jude**

CEO,  
Postdoctoral fellow.  
Dr. Eng.

- 2012/10

**Undergraduate**  
Mechanical Engineering (G30 Automotive)
  
- 2016/10

**Masters**  
Mechanical Systems Engineering (G30 Automotive)
  
- 2018/04

**First Startup**  
Video based online housing service
  
- 2018/10

**PhD**  
Mechanical Systems Engr. [System Modeling, \*Automated driving]
  
- 2021/10

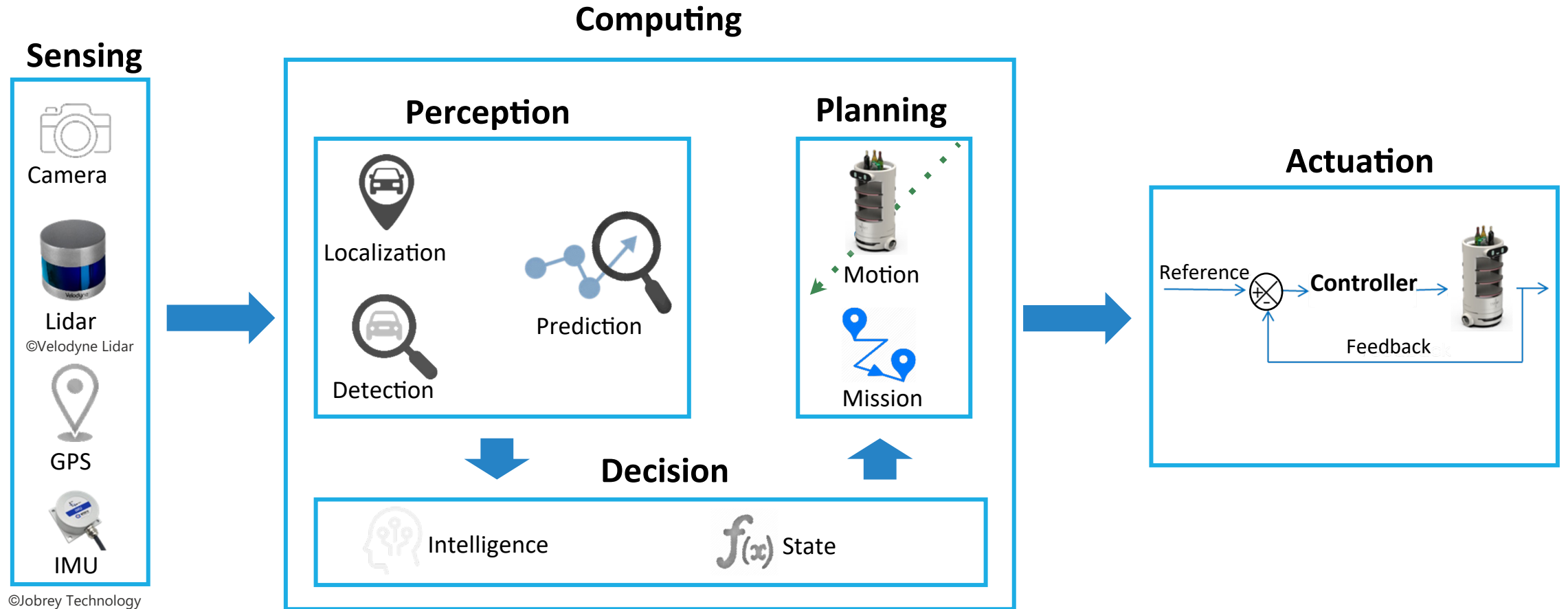
**Postdoctoral Researcher**  
Engineering & Robotics
  
- 2022/05

**Second & Current Startup**  
Fainzy technologies Co. Ltd (Robotics, AI, & IoT)

# Introduction: Autonomous Driving – How?







# Autonomous Driving: Basic Concept



# Autonomous Driving: Environmental Sensing

## Sensing

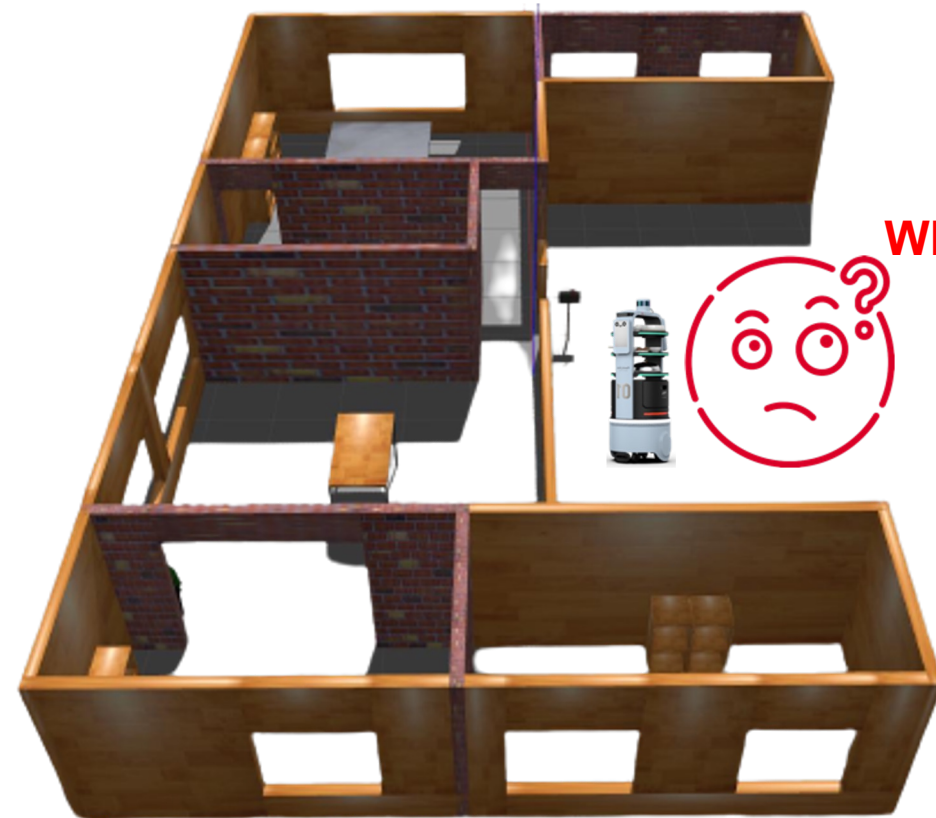
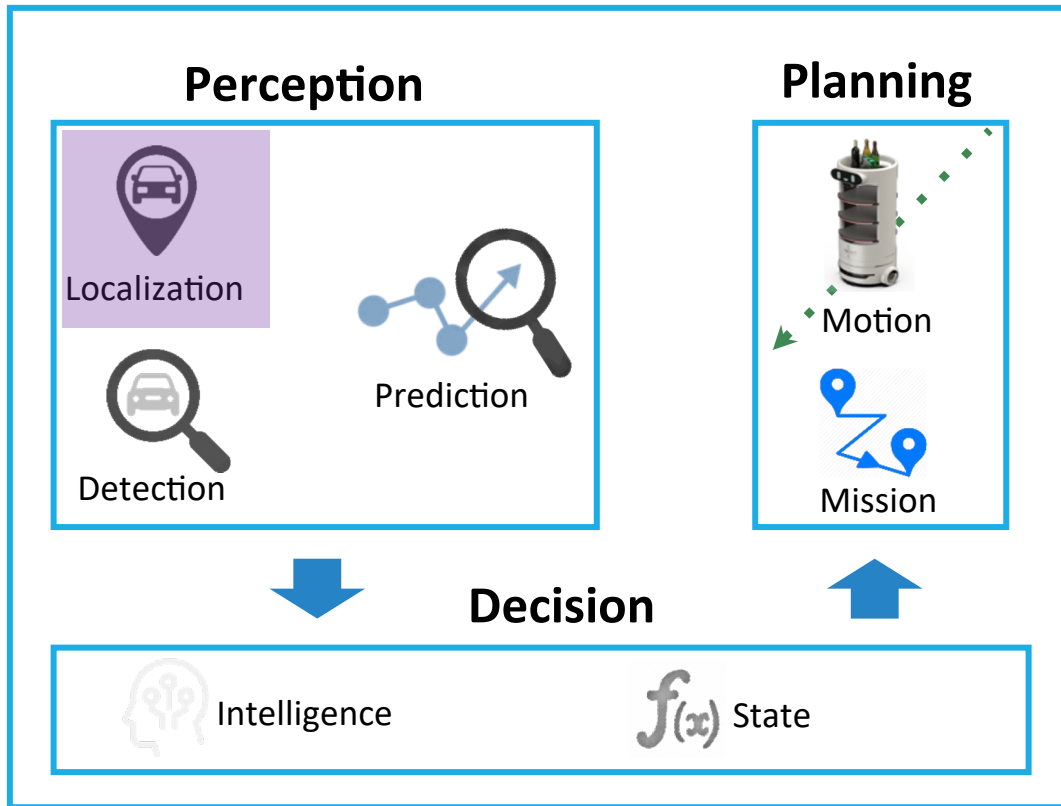
-   
Camera
-   
Lidar  
©Velodyne Lidar
-   
GPS
-   
IMU  
©Jobrey Technology



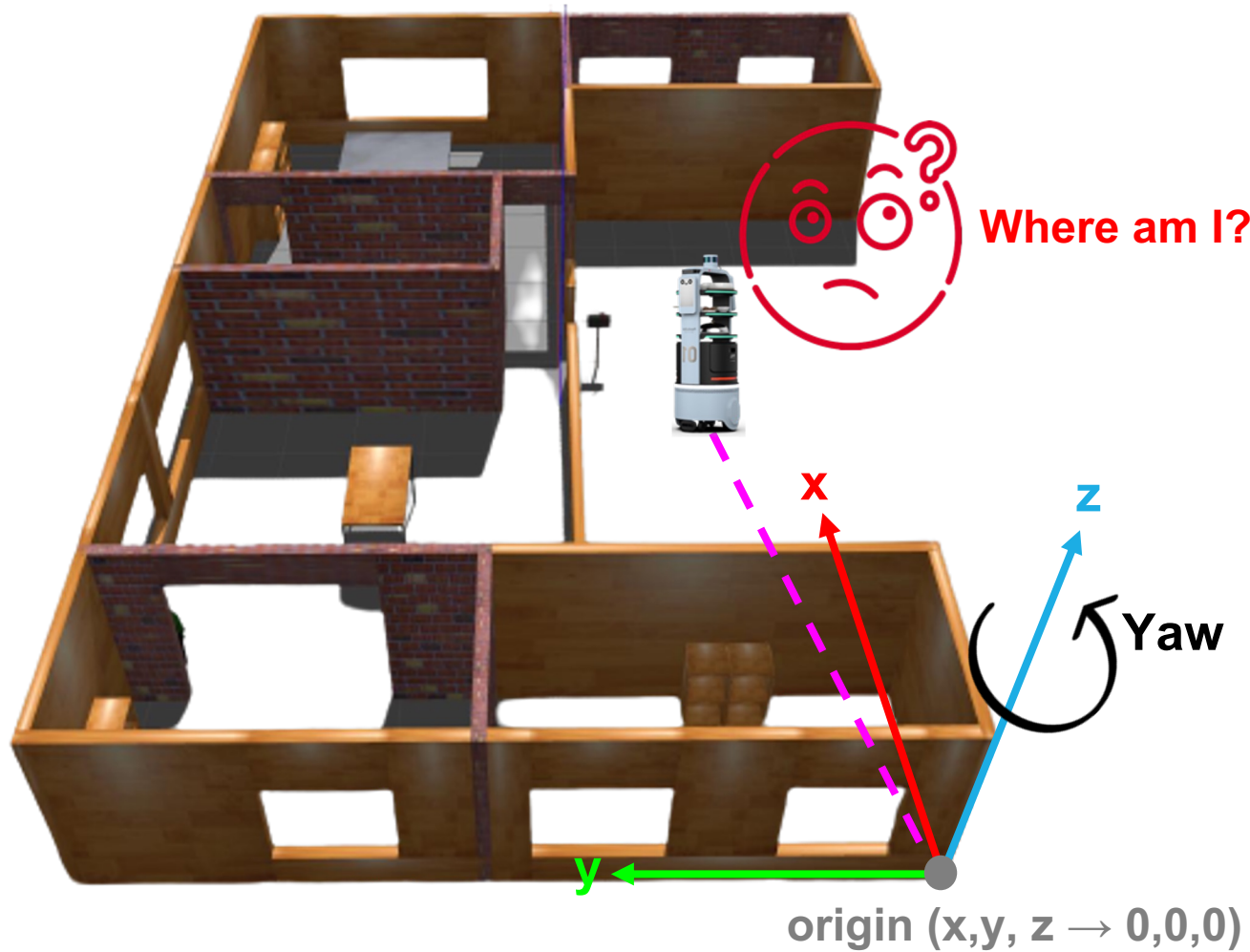
The screenshot displays the Rviz2 environment. On the left, the 'Image' panel shows a camera feed of a person standing in a large, open indoor space. On the right, the 'Displays' panel shows a 2D occupancy grid map. A green line represents the robot's path, starting from a blue square and moving towards a green circle. The velocity is shown as 0.000000 m/s. In the top left of the map, there are two boxes: one with '0.03' (labeled 'calc time (sec)') and 'aware', and another with '0.55' (labeled 'velocity (m/s)') and 'unaware'. At the bottom, the 'Time' panel shows ROS Time: 1690186134.49, ROS Elapsed: 313.70, Wall Time: 1690186134.52, and Wall Elapsed: 313.71. There is also an 'Experimental' checkbox at the bottom right.

# Autonomous Driving: Localization – What?

## Computing



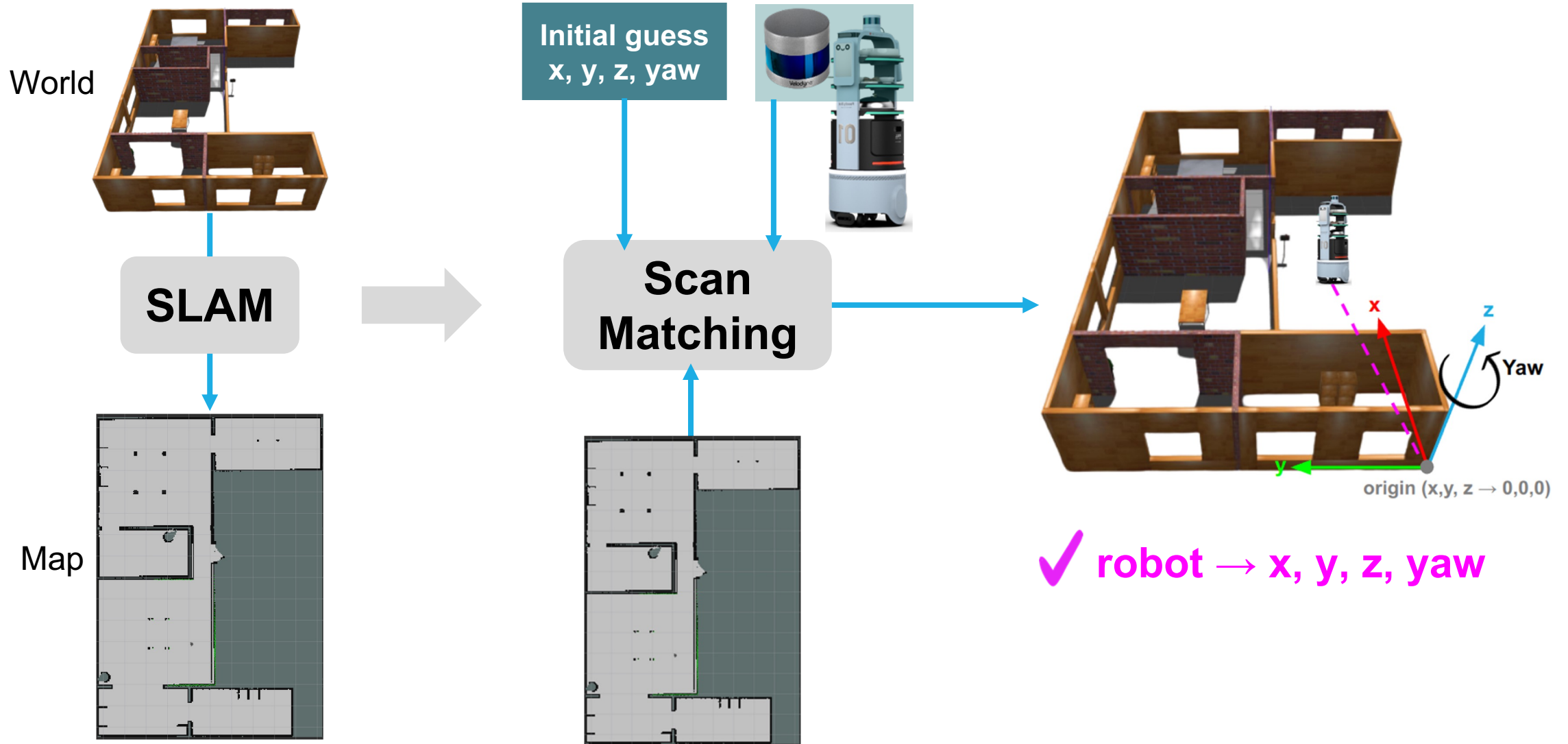
# Autonomous Driving: Localization – Concept



Every point in the world:

- x, y, z (position)
- yaw (direction or heading)

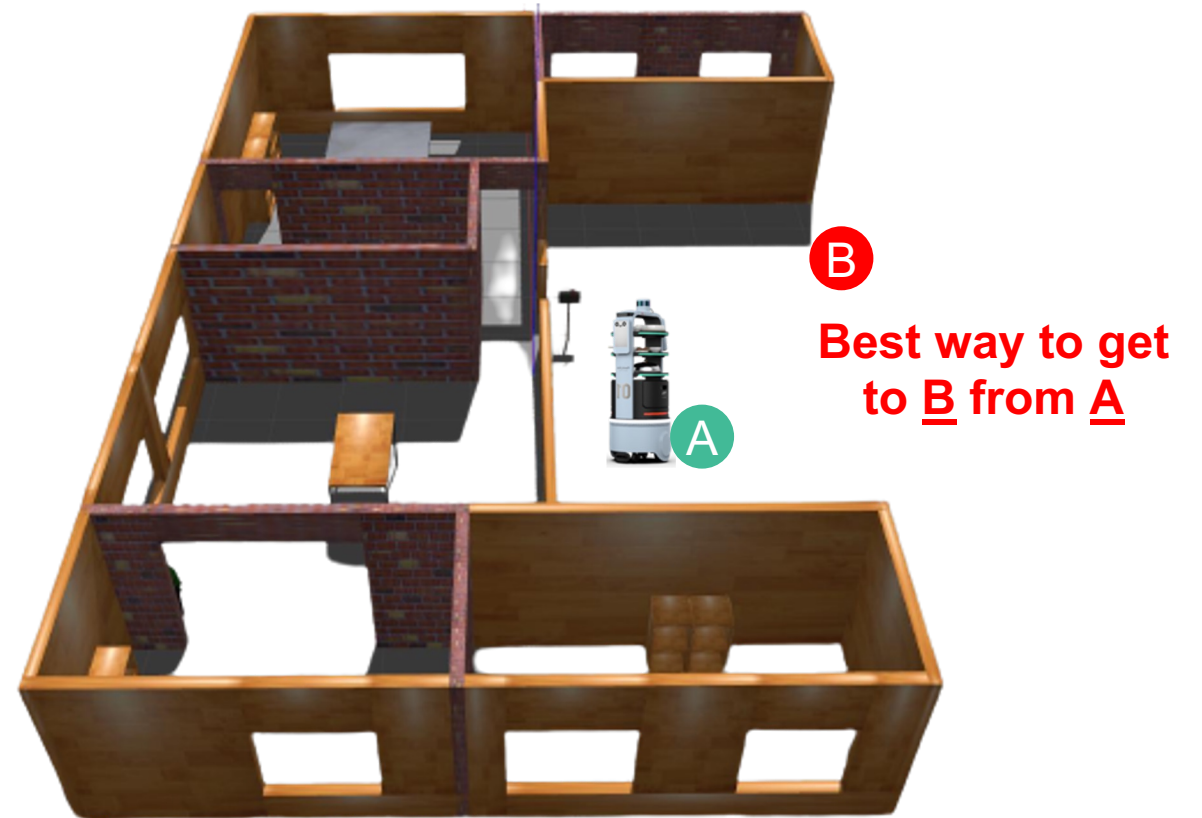
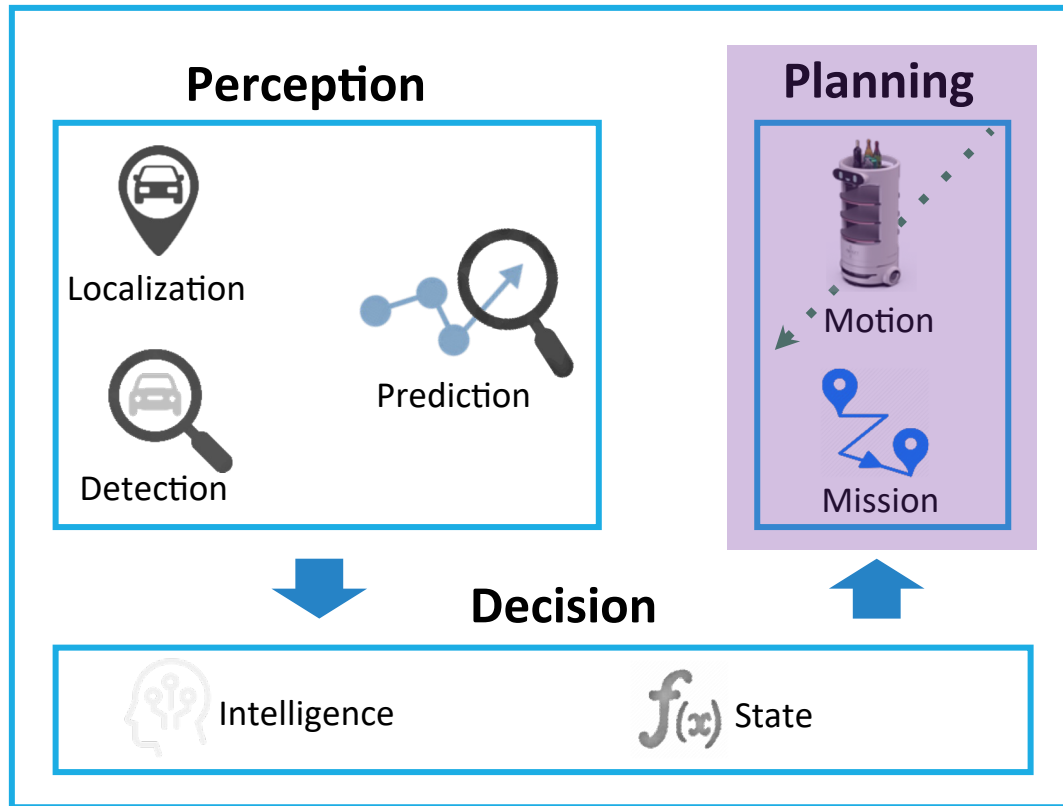
# Autonomous Driving: Localization – How?



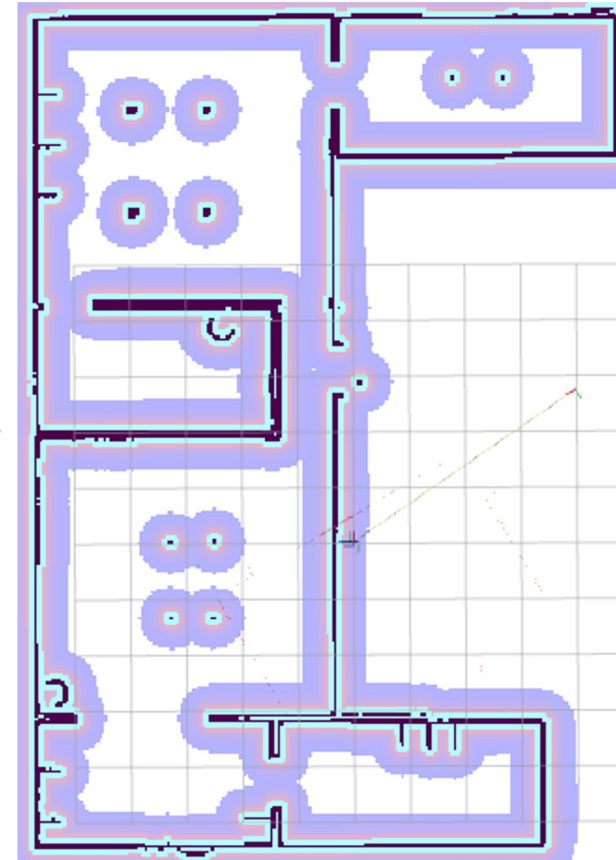


# Autonomous Driving: Planning – What?

## Computing



# Autonomous Driving: Planning – Concept

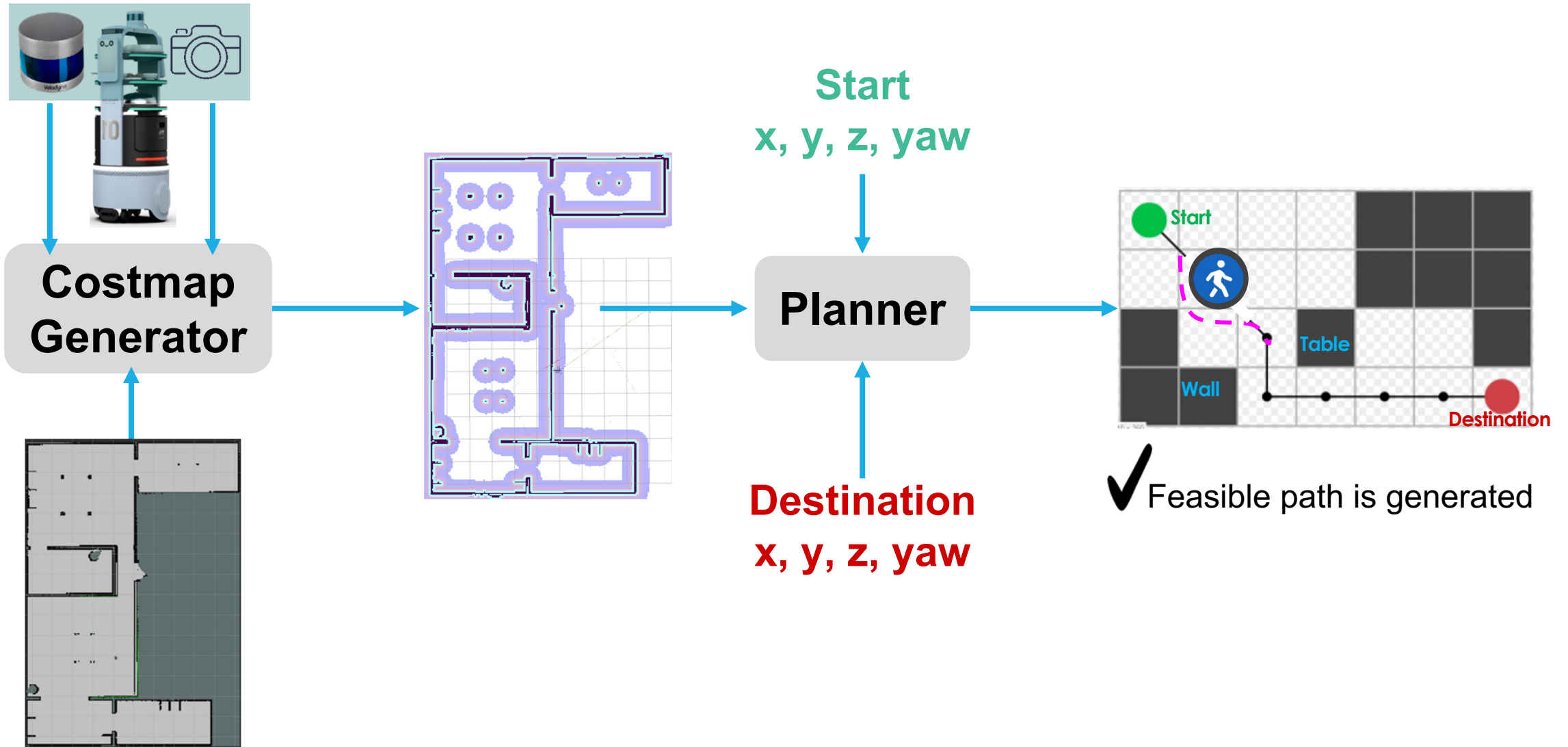


## World representation:

- Costmap

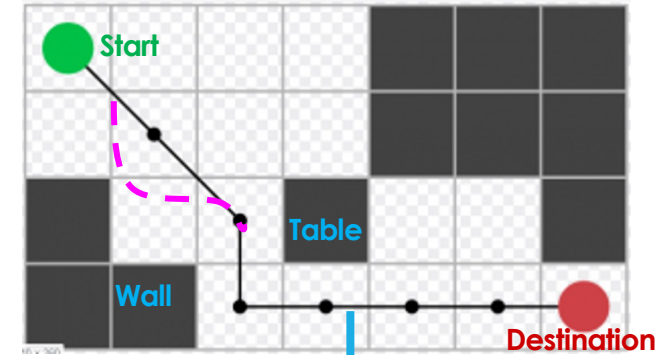
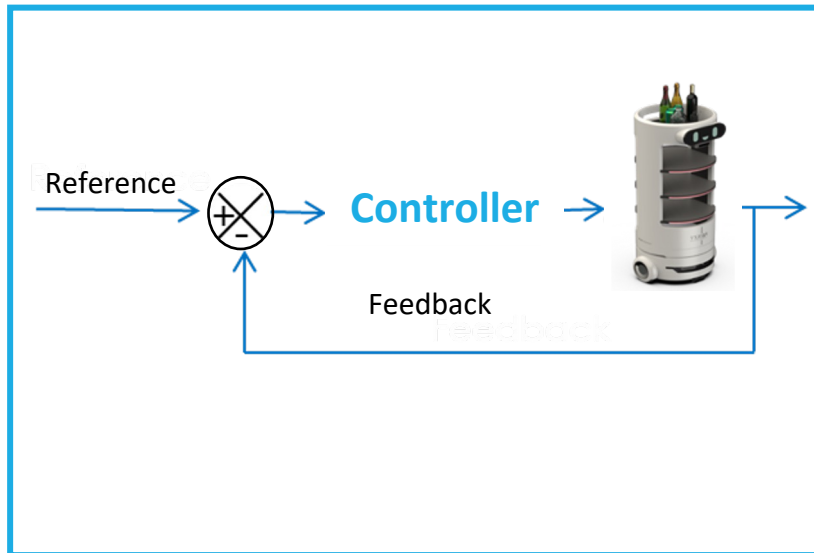
- Gridded
- 0 - 254
- 0: free space
- 254: Occupied
- Gradient

# Autonomous Driving: Planning – How?



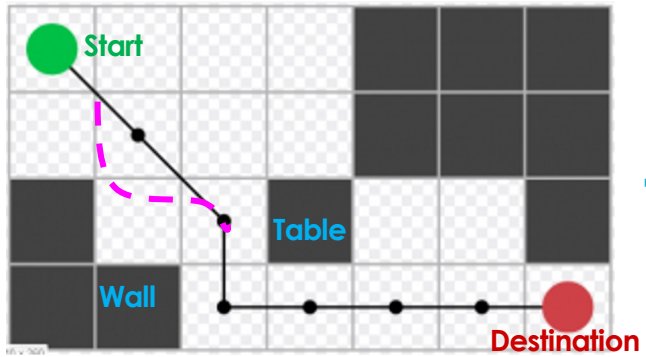
# Autonomous Driving: Actuation – What?

## Actuation



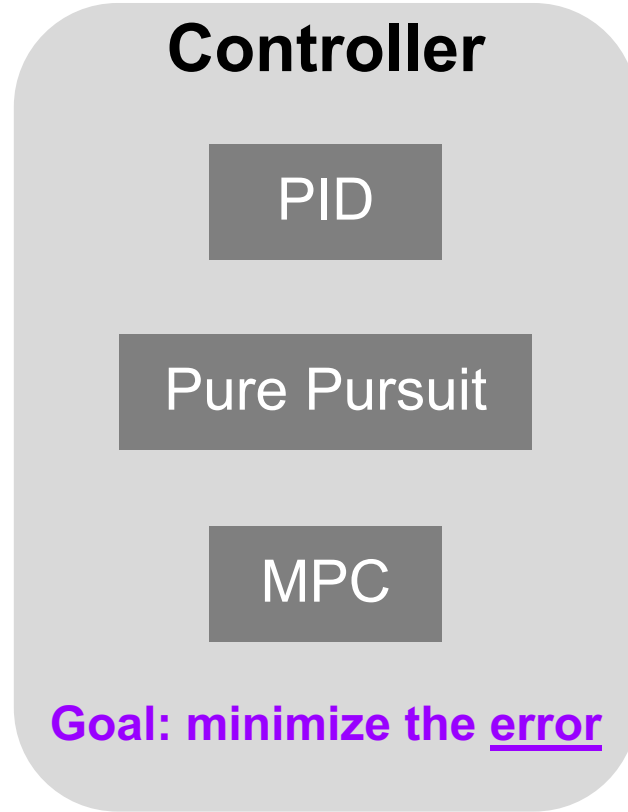
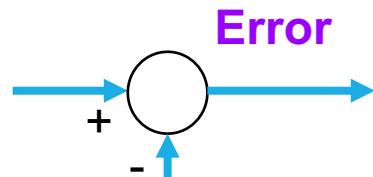
**Given a feasible path,  
how can I accurately follow it?**

# Autonomous Driving: Actuation – How?



Feasible path:

- $x, y, z, \text{yaw}$
- $\text{speed}^*$

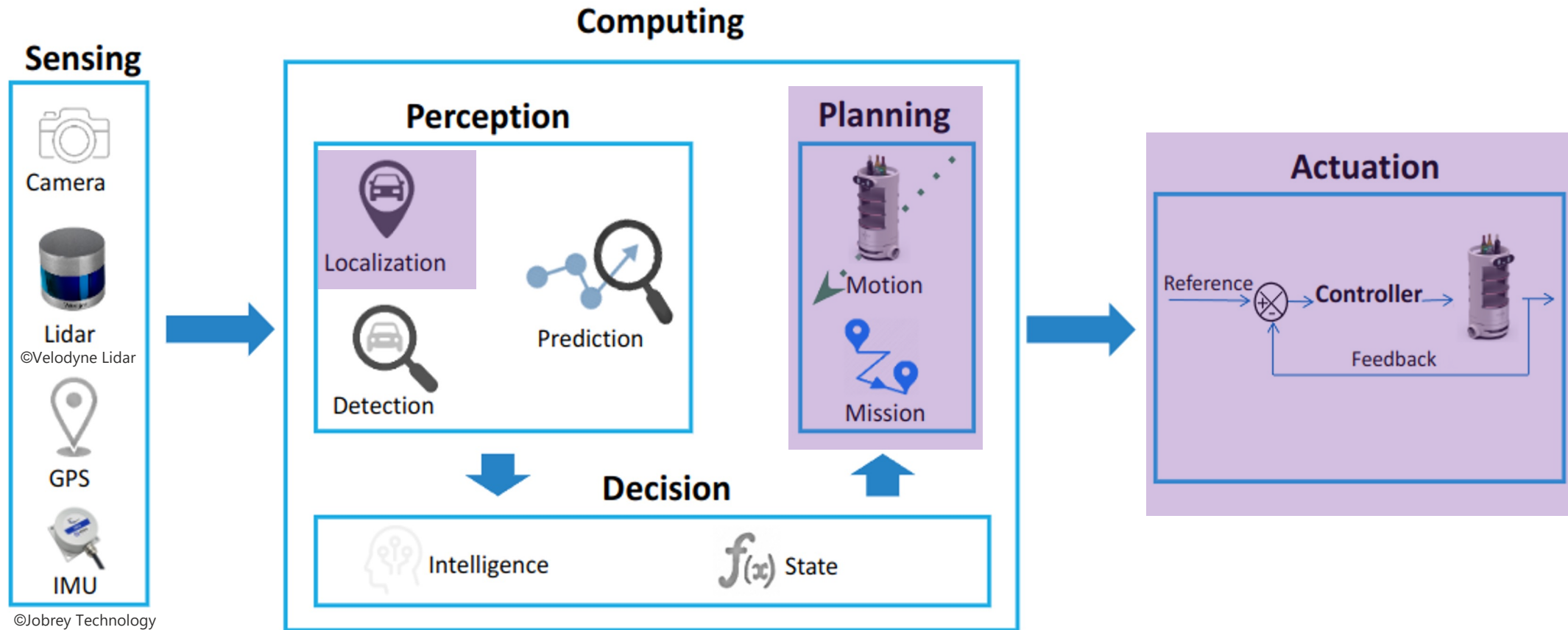


Robot State:

- $x, y, z, \text{yaw}$
- $\text{speed}$

# Discussion: Exercise

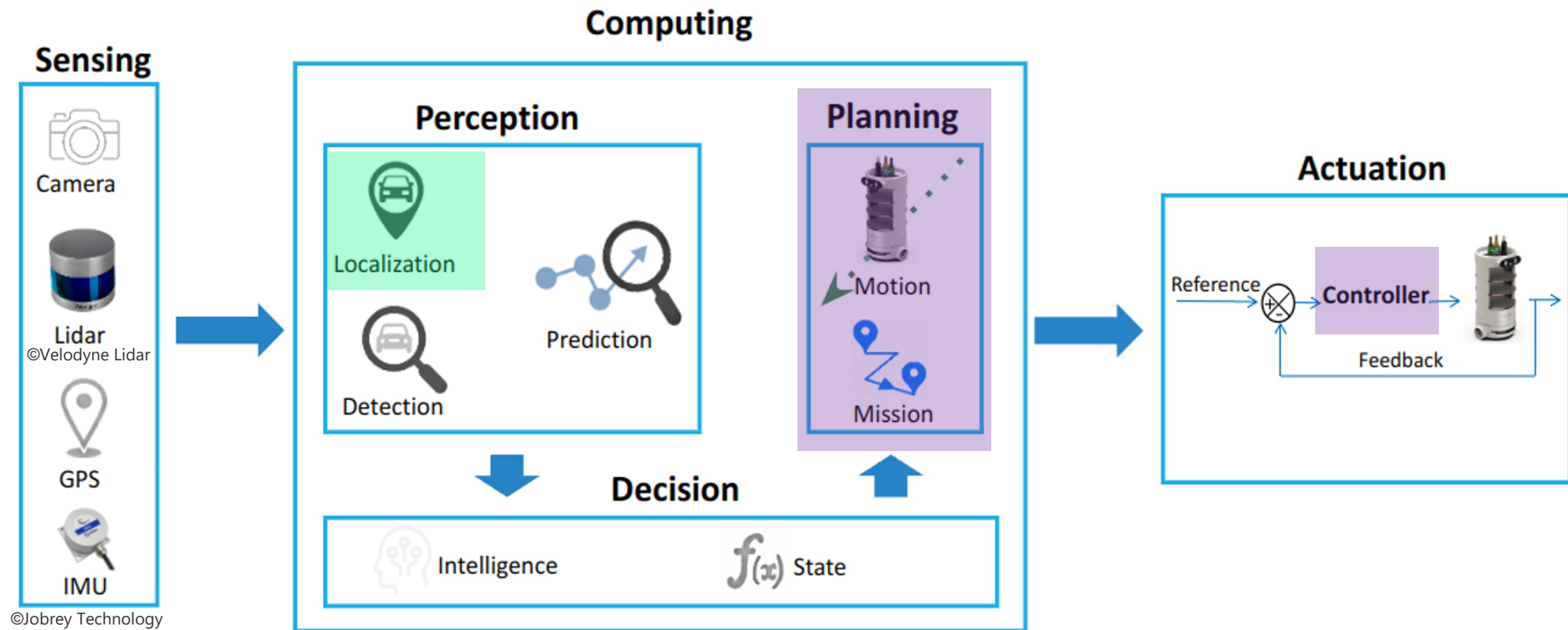
Which is the most Important?



# Discussion: Exercise

Which is the most Important?

✓ Localization



# Discussion: Questions







**Establishment Date**

May 24th, 2022

**Address**

Nagoya University Incubation Facility  
Furocho, Chikusa-ku

**HP**

[www.fainzy.ai](http://www.fainzy.ai)

# Introduction: About Fainzy Tech



# Last mile Robot Delivery Service



FAINZY  
TECHNOLOGIES





High operational cost



Lengthy delivery times

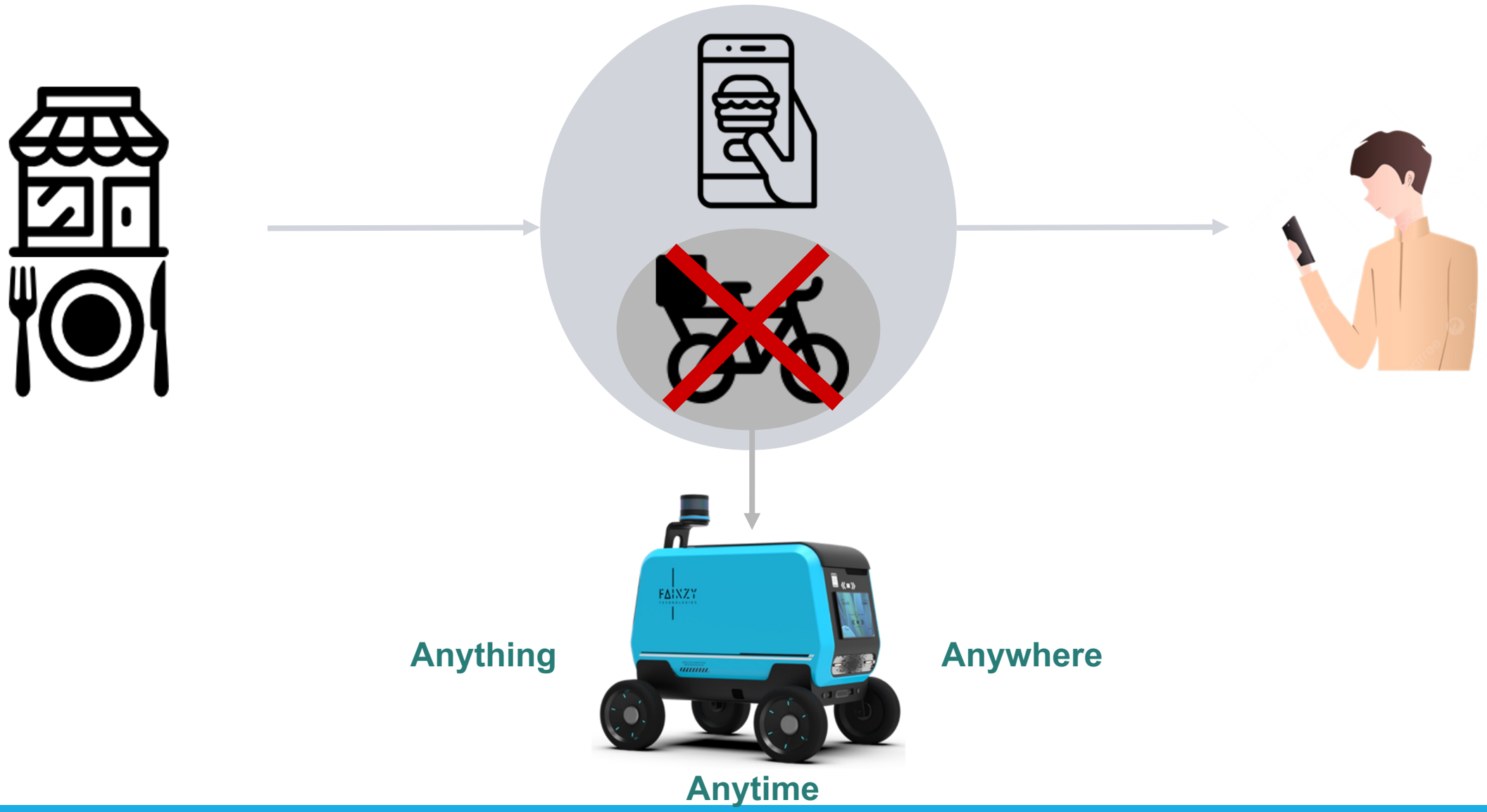


Limited pool of drivers



Weather & Time Constraints

# Solution: Concept

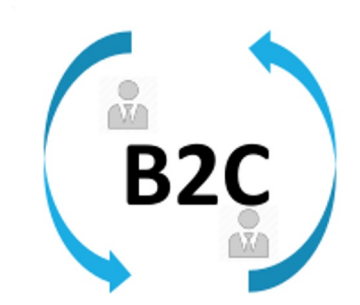


## Target Customer

User of various delivery platforms



10% +  $\alpha$  per order



50%~ reduction

Our Price: 5% per order



Cost reduction



Delivery efficiency



Contactless delivery



ZiBot



Nagoya University



Usage Test, Dec. 2024 ~



Dr. Jude Nwadiuto  
**Business • Engineering**

Postdoctoral Fellow at Nagoya University  
Human Factors in Automated Driving  
Startup Experience



Emmanuel Omeogah  
**IoT**

Working at The Blockchain Company



Patric John  
**Design**

Master of Design  
Lecturer at a Leading university in India

## Advisors



Dr. Tatsuya Suzuki  
Vice Dean, Graduate School of Engineering  
Nagoya University  
Global Research Institute for Mobility in Society (GREMO),



Dr. Hiroyuki Okuda  
Associate Professor  
Graduate School of Engineering  
Nagoya University



# Student to Startup: Practical Tips – The Decision

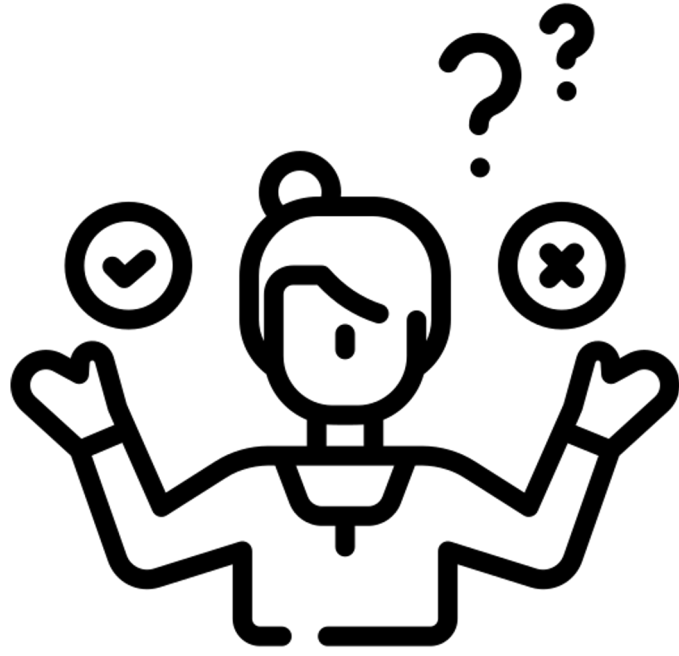
Is Startup really for you?



Interesting



Autonomy



Hard



High Risky



Rewarding

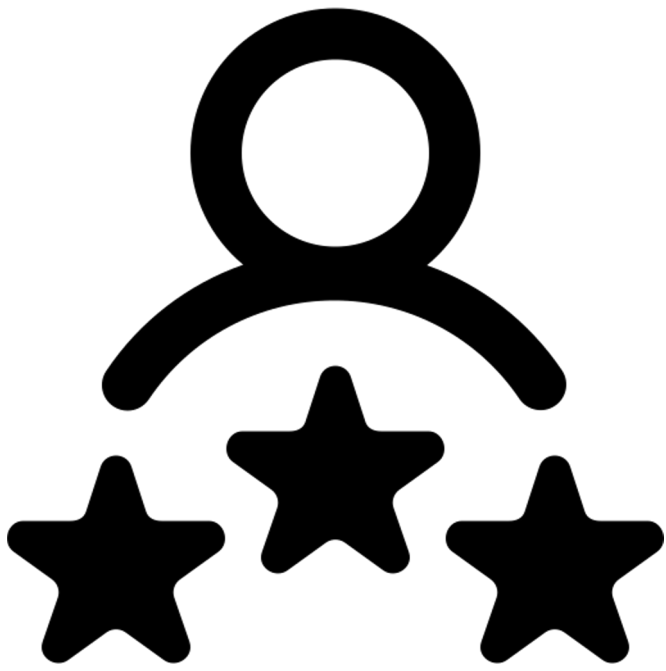


Time consuming



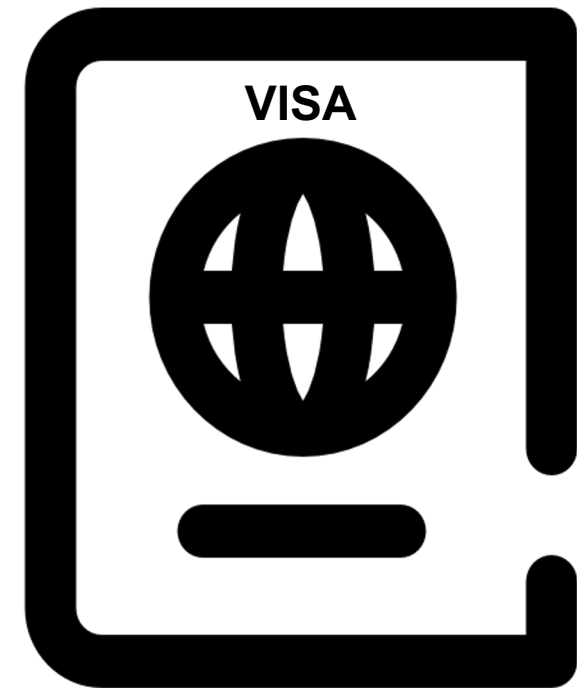
Stressful

# Student to Startup: Practical Tips – Pitfalls



Start in your area of specialty

Antidote of risk

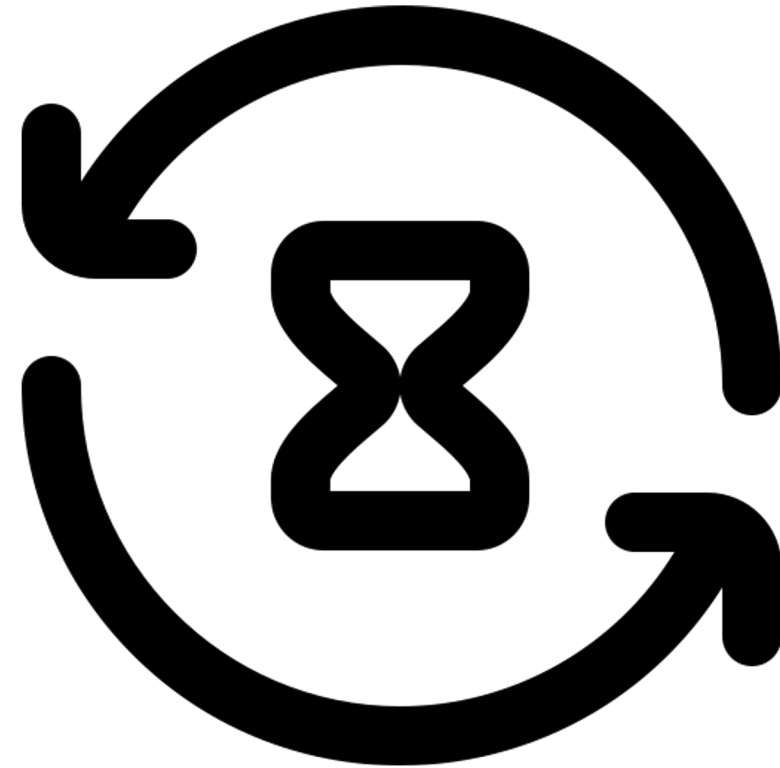


Plan ahead of time

**Cannot manage a business  
without the right visa**



Find a Strong WHY



Let the Process be the Reward



Dr. Jude Nwadiuto  
**Business • Engineering**

Postdoctoral Fellow at Nagoya University  
Human Factors in Automated Driving  
Startup Experience



Emmanuel Omeogah  
**IoT**

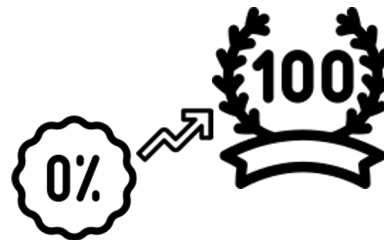
Working at The Blockchain Company

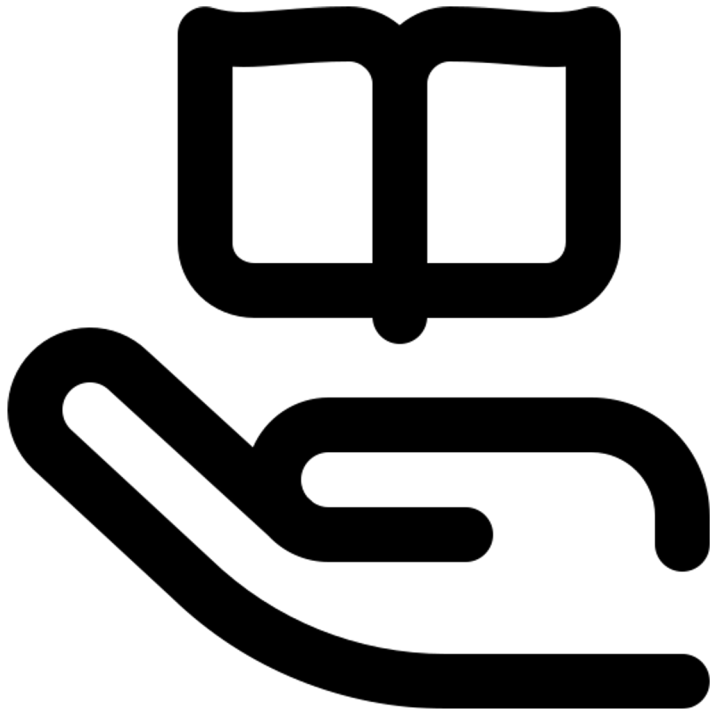


Patric John  
**Design**

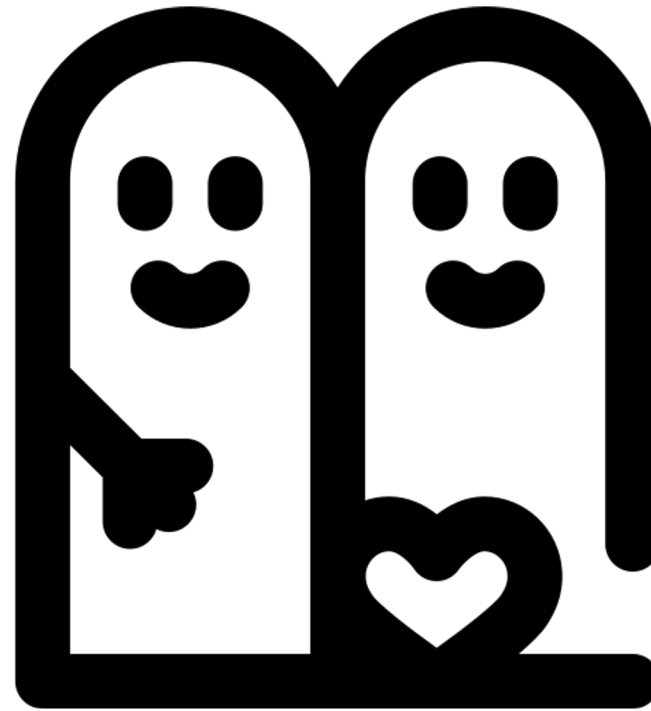
Master of Design  
Lecturer at a Leading university in India

## Complementary Skill Set





Master how to learn



Good relationship is Gold

# Discussion: Questions?

