

# **TESTING AUTONOMOUS BEASTS**

**WITH GREAT VALUE COMES GREAT RESPONSIBILITY**

**IRJA STRAUS @ TESTBASH AUTUMN 2023**

# HEY 🙋

## I AM IRJA STRAUS

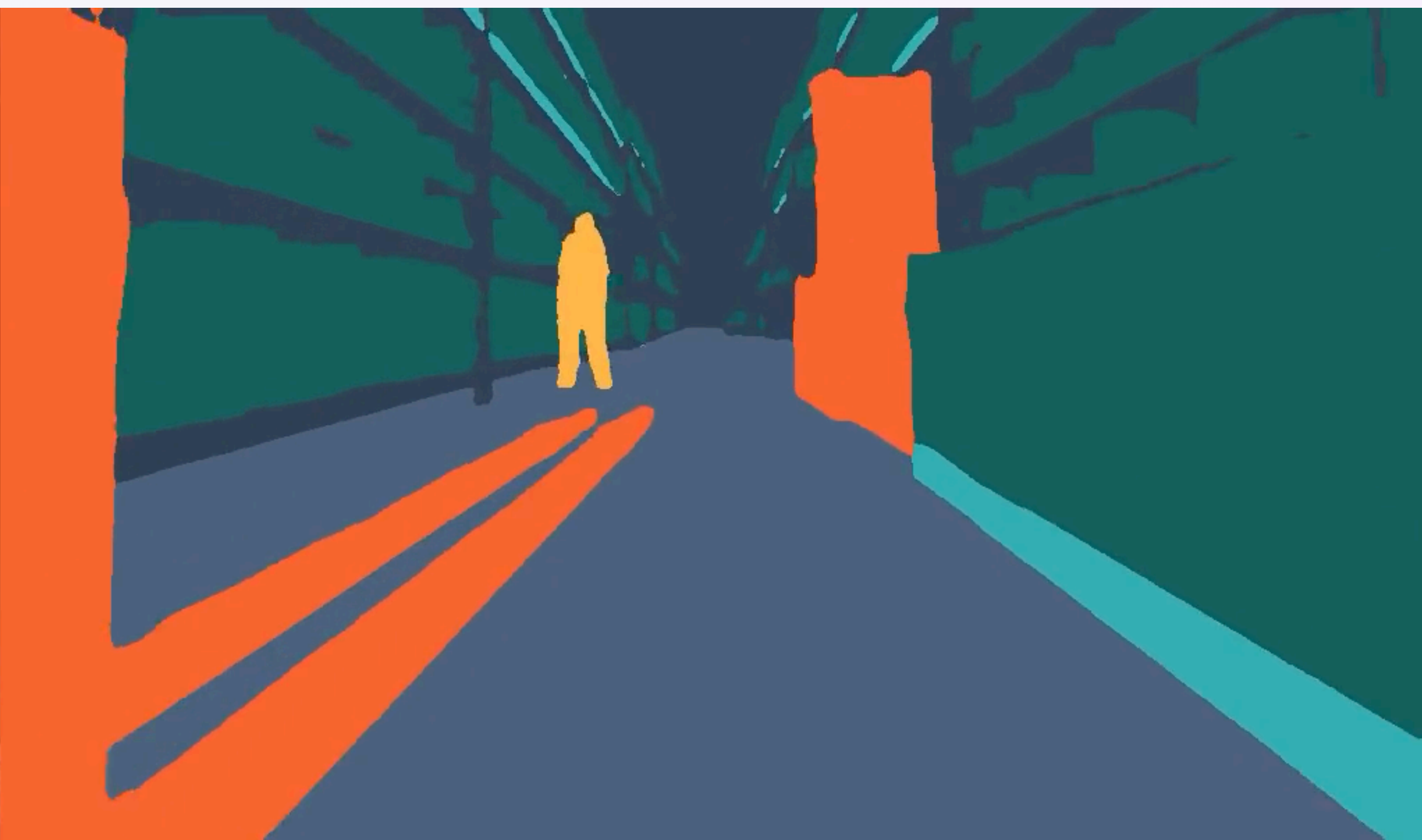
- Quality Manager at G I D E O N
- 14 years of experience in different roles
  - tester, business analyst, product manager
  - explorer



# IN THIS TALK

- **Context and value of testing**
- **Appliance of different testing approaches**
  - **Hardware and software specifics**
  - **Where does automation fit?**
- **Stories from a real world**

# THE CONTEXT



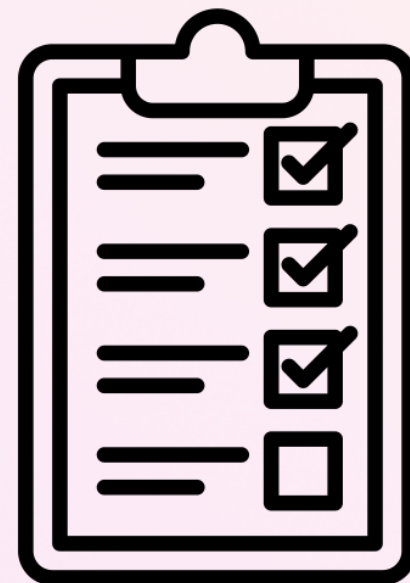
**THE HIGHER THE RISK**  
**THE BIGGER THE VALUE**

**ROLE OF A TESTER IS NOT TO BREAK THINGS**

# HARDWARE SPECIFICS

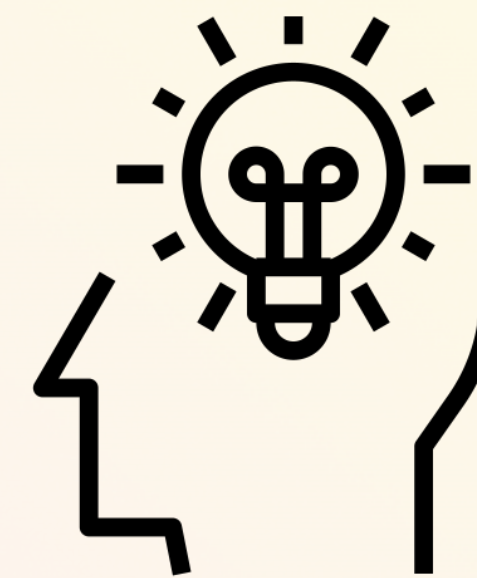
## TWO TYPES OF COMPONENTS

**3rd party**



**Quality Control**

**in-house**



**Exploratory Testing**

**EXPLORATORY TESTING IS SIMULTANEOUS  
LEARNING, TEST DESIGN AND EXECUTION**

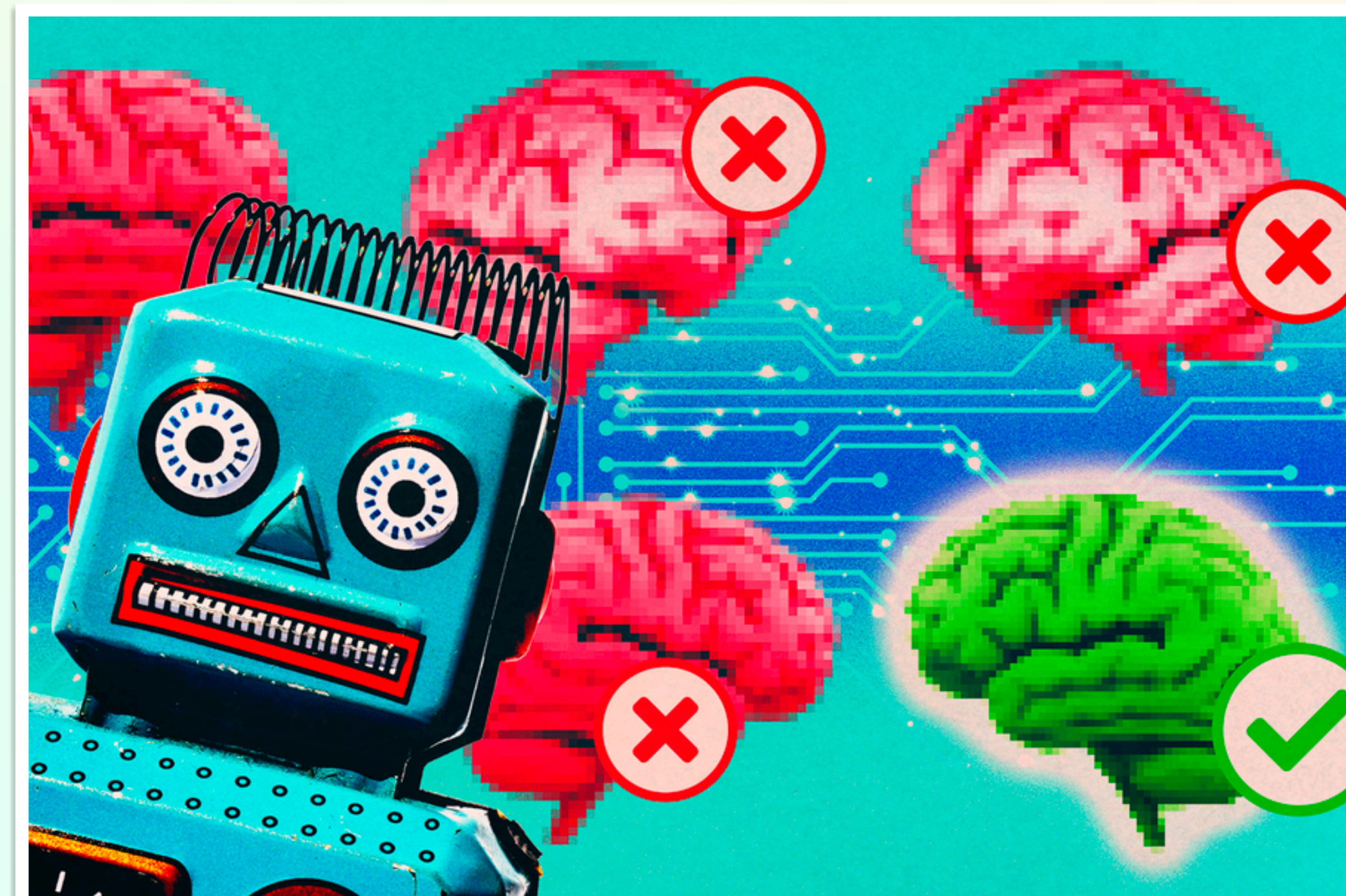
# "BUG CLEANER 3000"



# SOFTWARE SPECIFICS

## HOW WE TEST ROBOT *BRAINS*

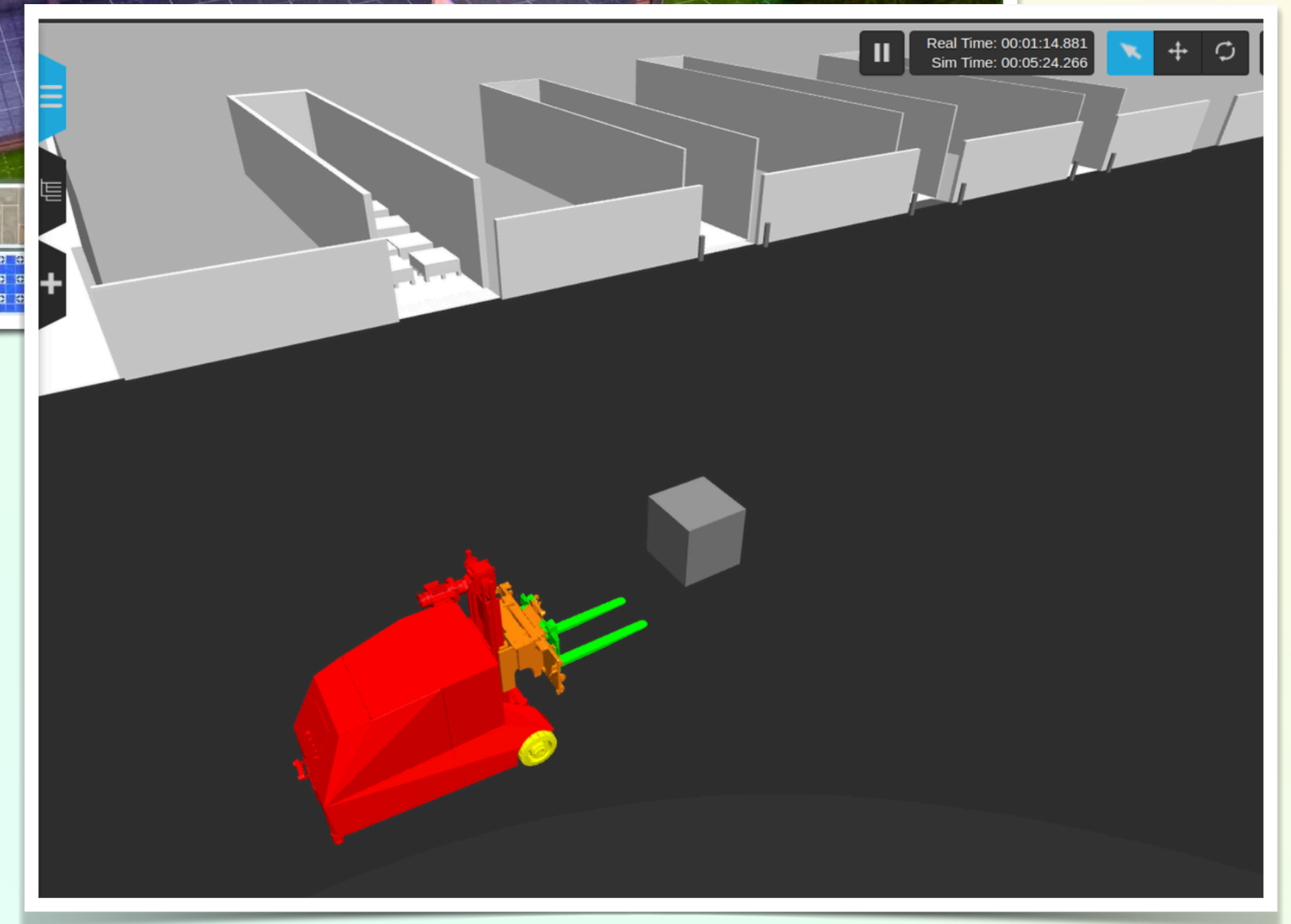
- **Unit & integration level tests**  
- **System level tests**
  - **Simulation**  GAZEBO
  - **Vehicle — real-world environment**



# SIMULATION

## THE KEY INGREDIENT

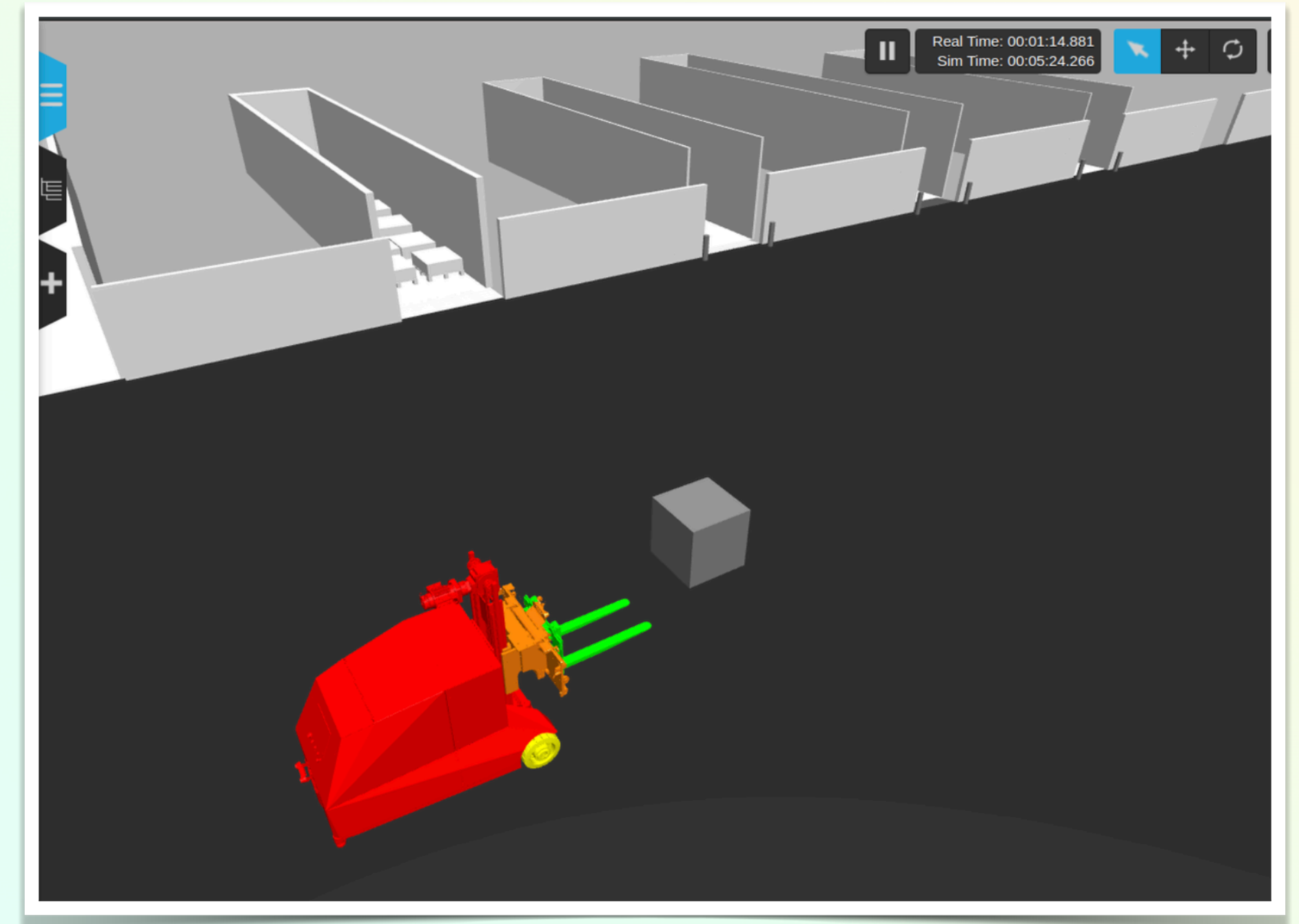
- Simulating populations of robots in complex environments
- World files, models



# SIMULATION

## THE KEY INGREDIENT

- **Testability matters**
  - **Achieving high real-time factor**
  - **Building good models**



# SIMULATION

## THE KEY INGREDIENT

### What **CAN** be tested

- Basic manoeuvres
- Assignment completion
- *Bonus: client business case feasibility*

### What **CANNOT** be tested

- Safety
- Semantics
- Physics

# TESTING THE REAL BEAST

## OPPORTUNITY COSTS

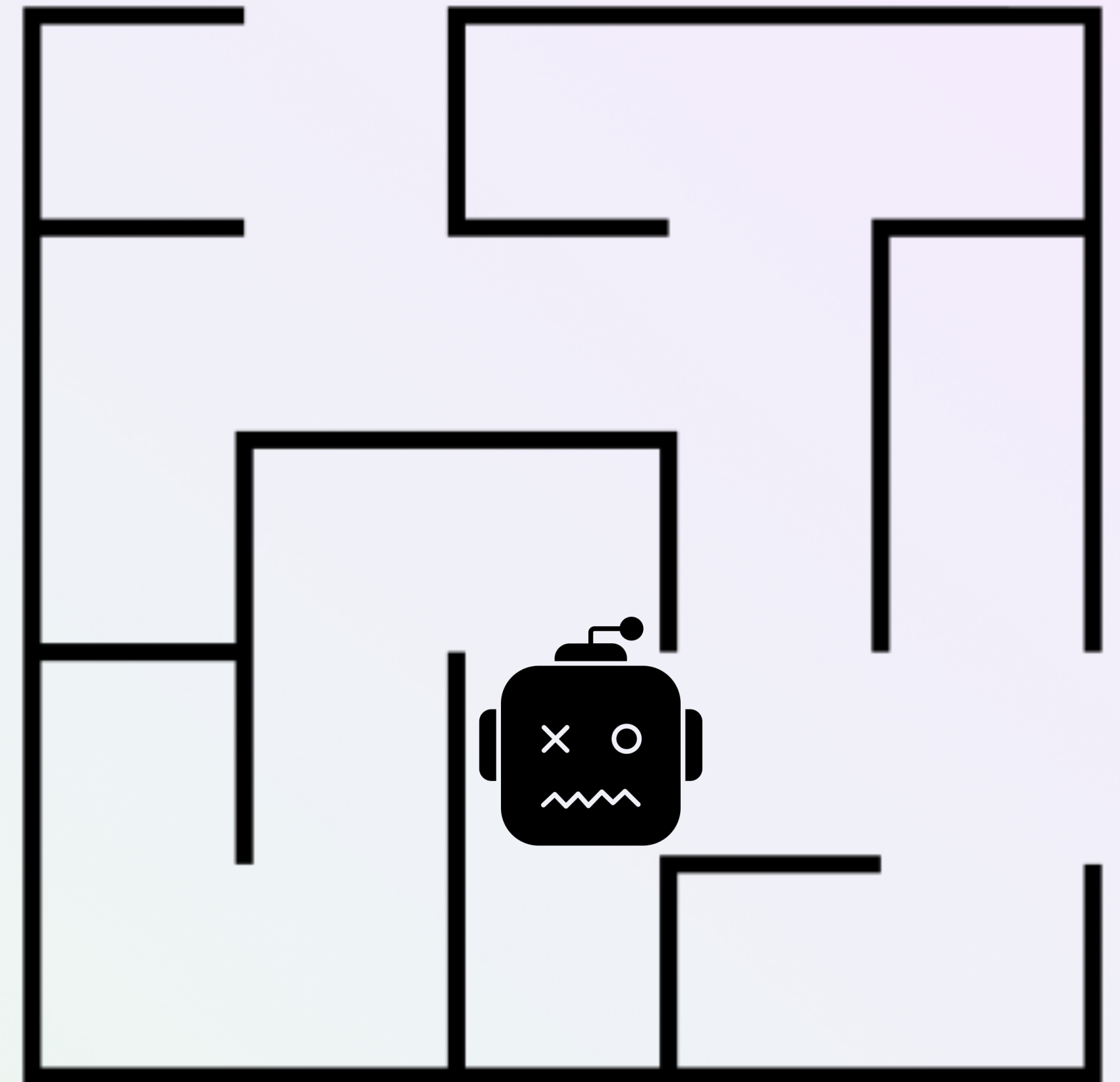
- **Tester as a part of the test environment.**
- **Robots might act unpredictably. Safety first.**
- **Preparation is the key: plan charters in advance.**



# EXPLORE THE ENVIRONMENT

Unpredictable conditions:

- Light
  - Strength of Wi-Fi signal
  - Humidity
  - Slippery floors or ramp
- ... and more.



# TEST AUTOMATION

## WHAT TO AUTOMATE AND WHAT NOT?

- Log analysis — **YES**
- Verification if component is up — **YES**
- Verification of essential use cases — **YES**
- Safety — **WITH CAUTION**
- Sensors — **WITH CAUTION**
- Physics — **WITH CAUTION**

# **DARE TO TRY\***

**\* NEW INDUSTRIES AND TOOLS**

**\* DIFFERENT TESTING APPROACHES**

# THANK YOU!



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