



ÓBUDA UNIVERSITY

IROB - ANTAL BEJCZY CENTER  
FOR INTELLIGENT ROBOTICS

# The Big Meeting AI + Mechatronics

Galambos Péter

Robottechnikai Szakkollégium



NTP-SZKOLL-20-0043 Robottechnikai Szakkollégium -  
Tehetséggondozás és szakmai közösségépítés az OE  
ROSZ-ban - 1 000 000 Ft támogatás





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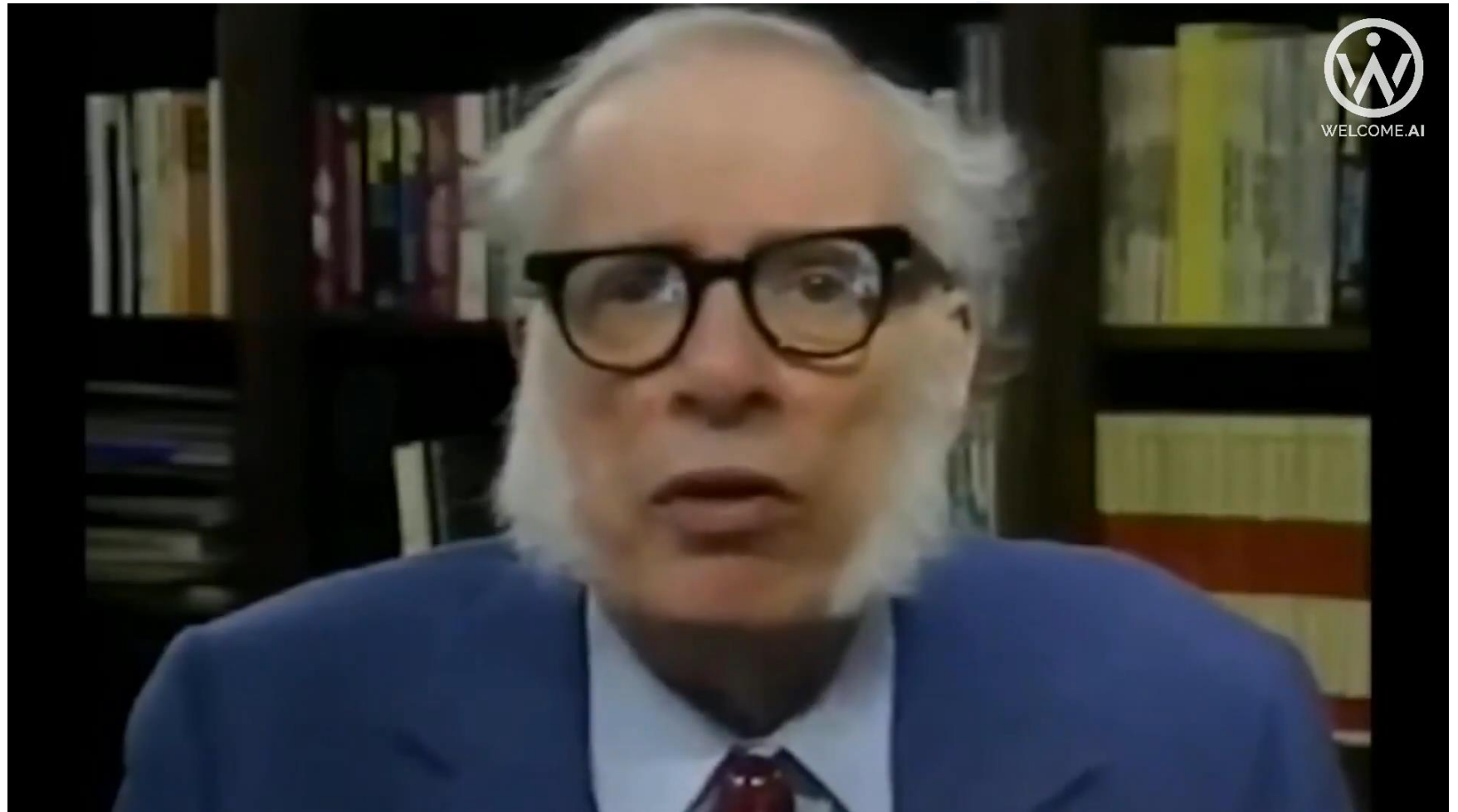
IROB – ANTAL BEJCZY CENTER  
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# The Big Meeting

## AI + Mechatronics

Péter Galambos, PhD  
director

Antal Bejczy Center for Intelligent Robotics  
EKIK – University Research and Innovation Center  
Óbuda University



Isaac Asimov  
1984

$$\int_{-\infty}^{\infty} R_{robotics} ds \in megatrends$$

- Drive force: Social changes
- Market CAGR > 15%
- Co-evolution with related fields

## Market signals

- **Service robot's market share reaches 66% by 2025.** (22% in 2015)
- **Chinese Industrial AI Firm Matrixtime Robotics Raises \$15M**  
In Series A Round (August 2020)
- **TOYOTA invested \$5+ Mrd in AI and robotics**
- **MIT new AI campus(50 full prof.) \$1 Mrd investement**
- Robots are getting the part of our everyday life: Shopping malls, hotels, restaurants, etc.

# Good old industrial robots

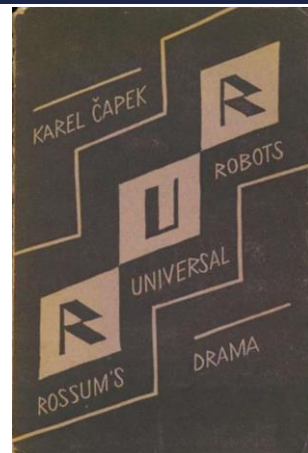


# The new wave - Cobotics

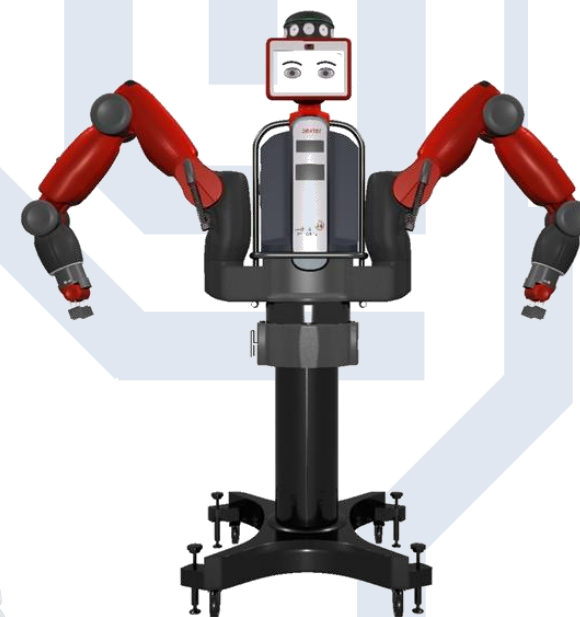


# Robot evolution

- **1920** – Karel Capek „RUR”
- **1960 – 1980** Heroic age
- **1980 – 1990** Mass spread
- **1990 – 2010** Sensors and realtime decisions
- **2012** – Collaboration, Mobility, Cognition



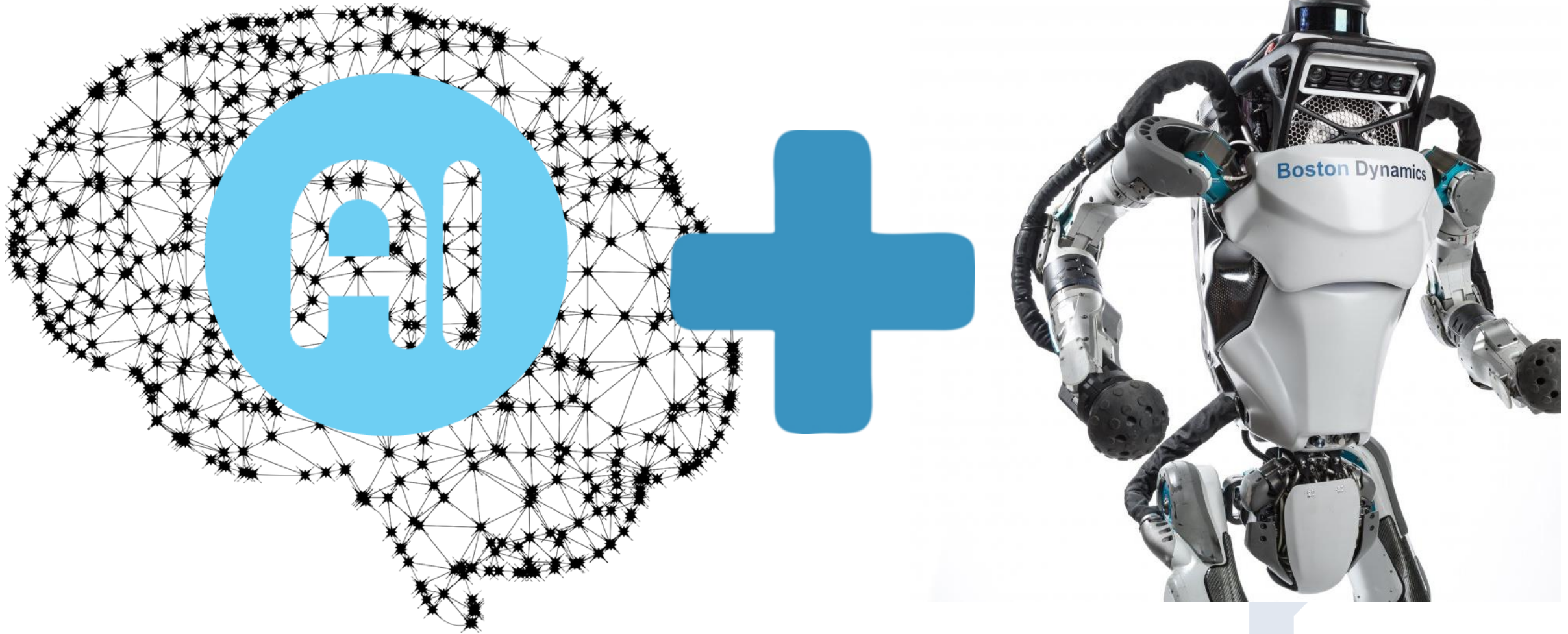
Unimate 2000 series Robot

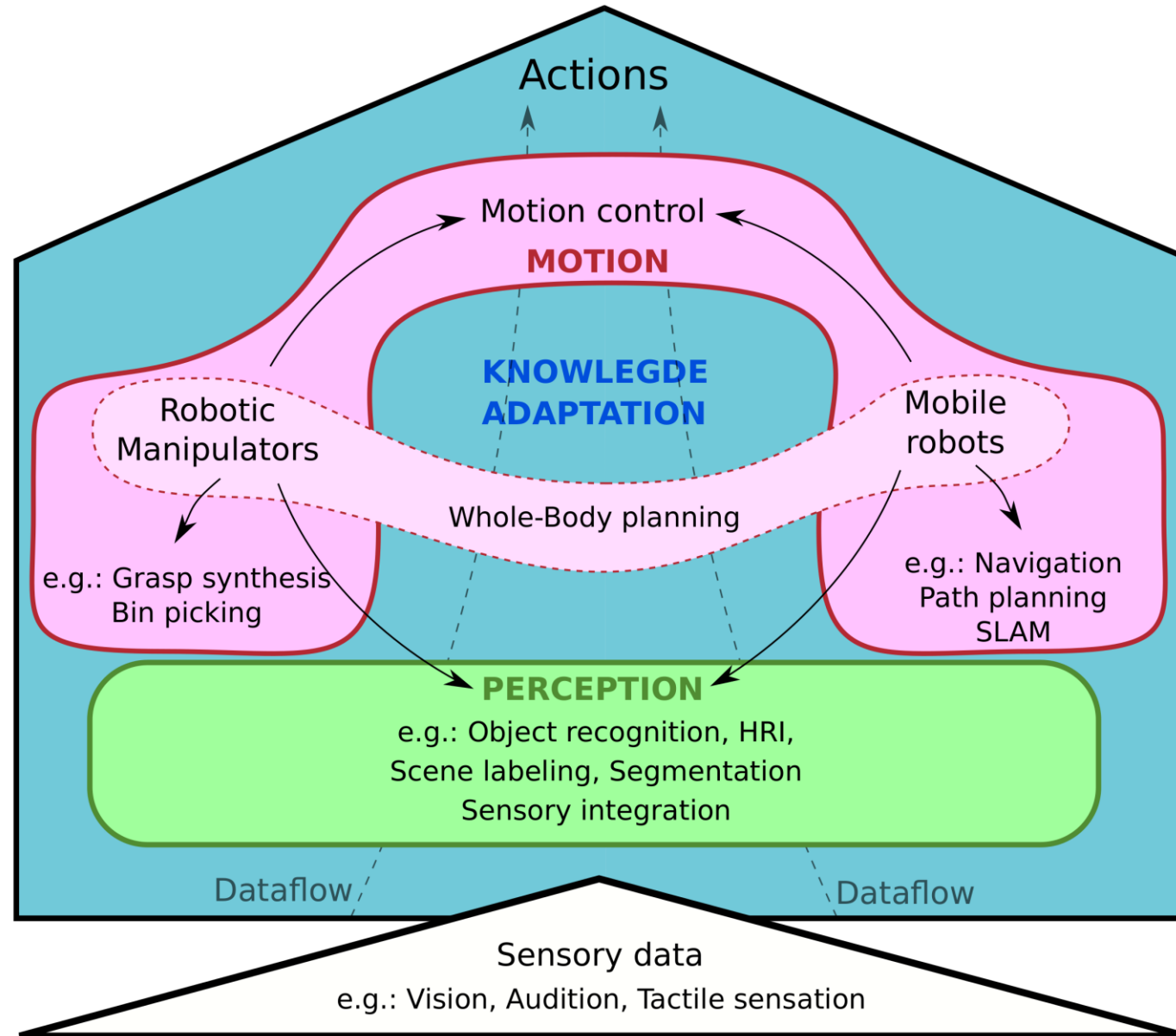


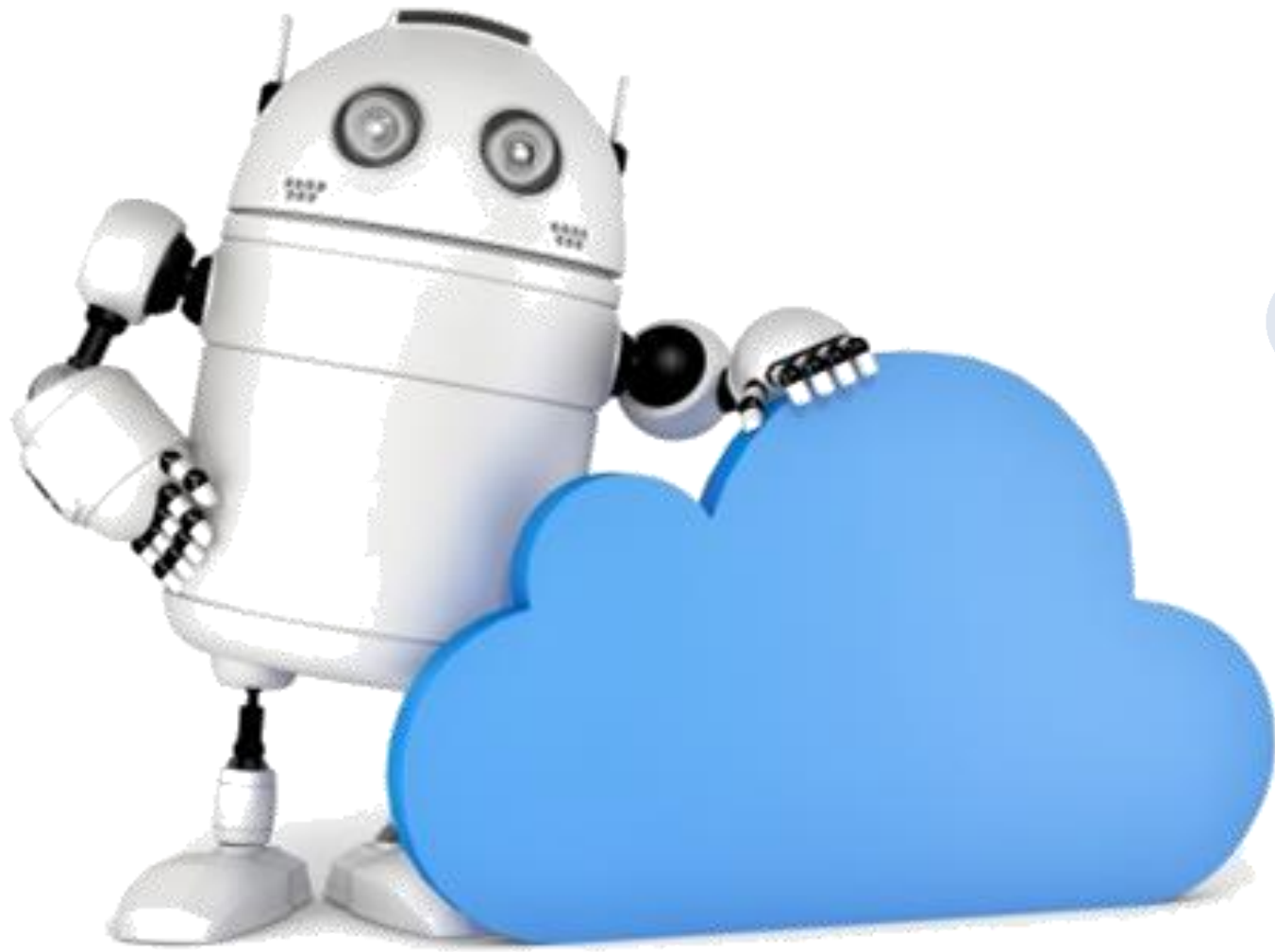


# What is Robot?









CONVENTIONAL  
ROBOTICS



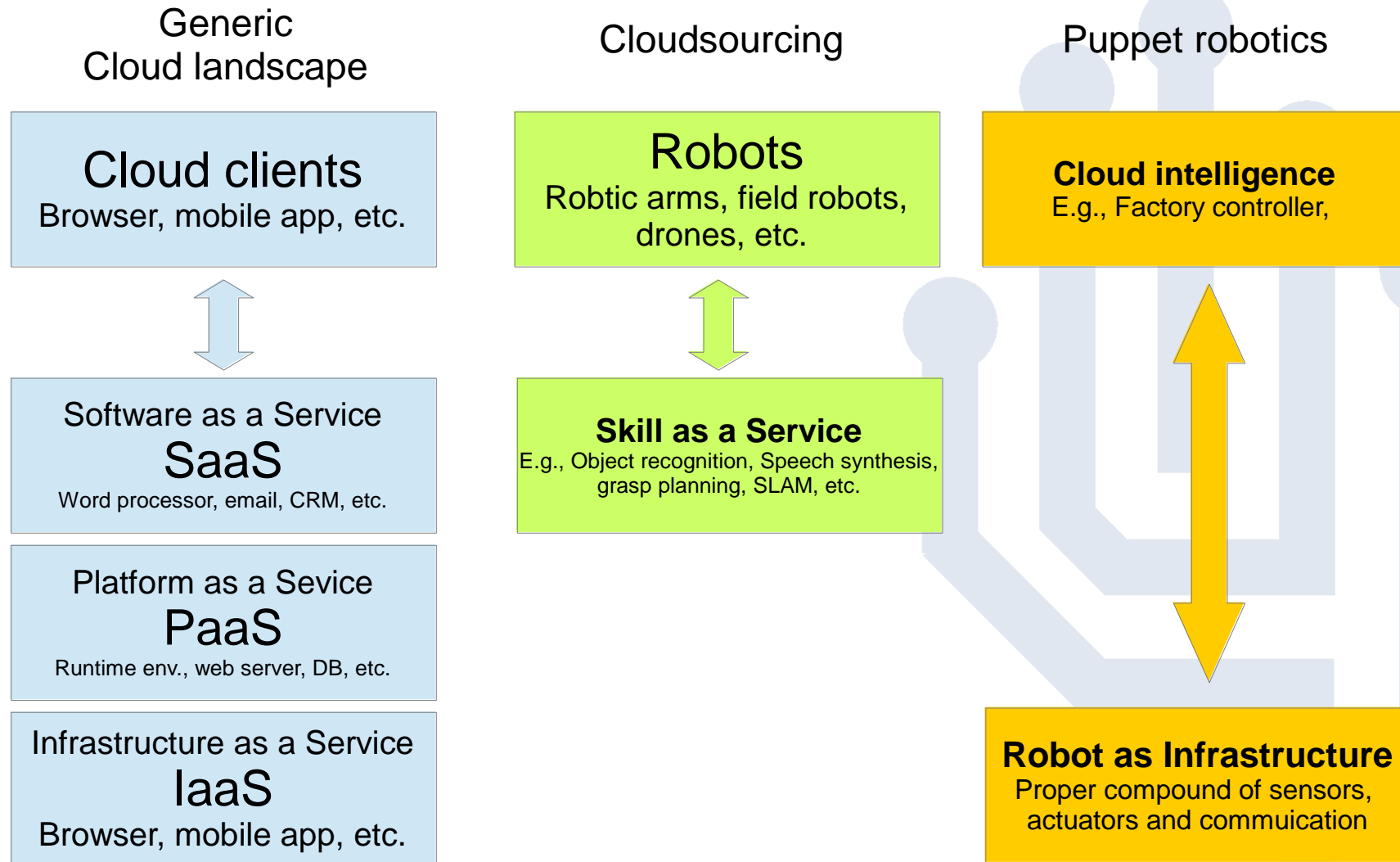
**All functions are  
on-board**

CLOUD ROBOTICS

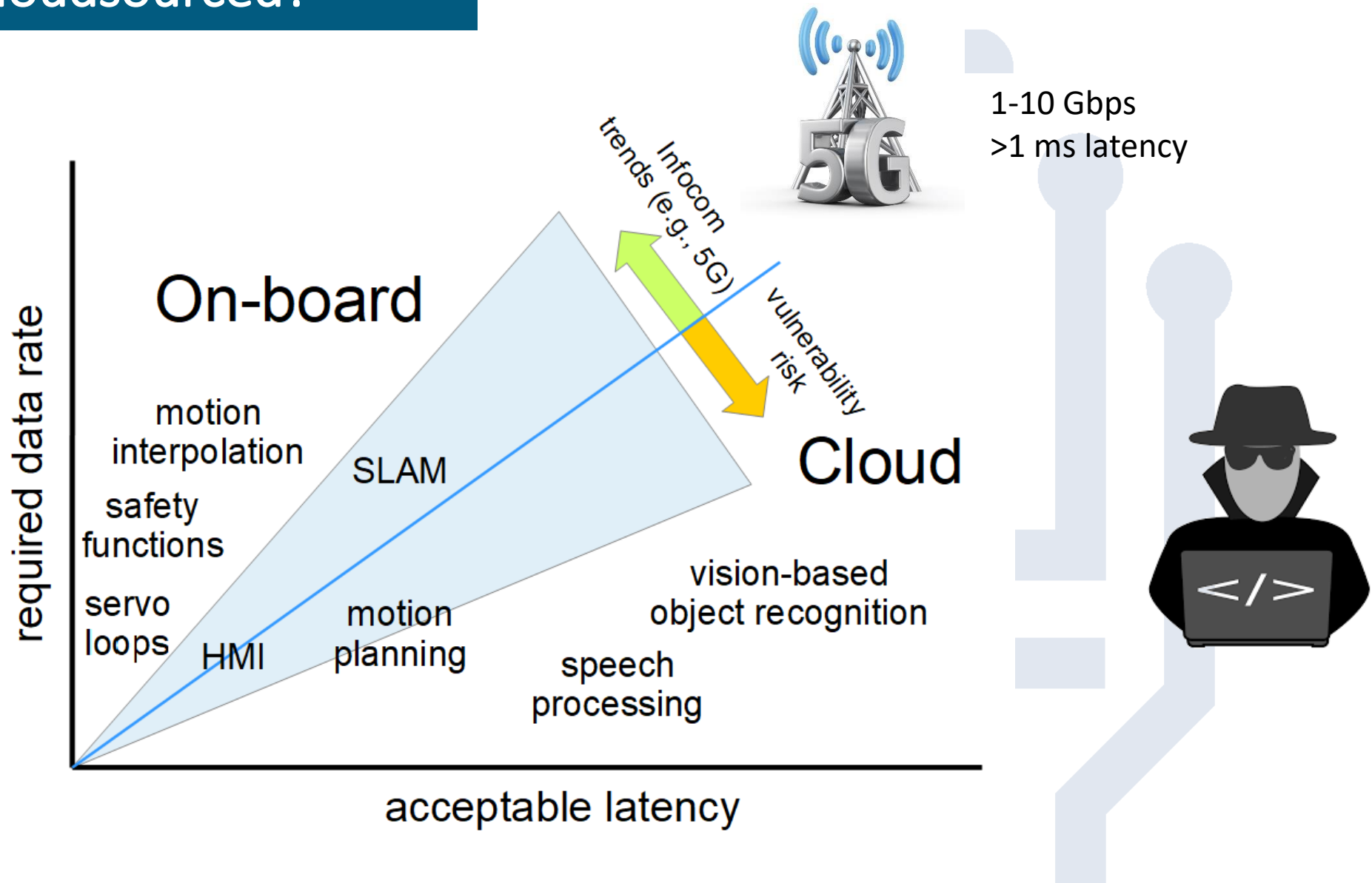


**Only sensing and  
actuation onboard**

PUPPET  
ROBOTS

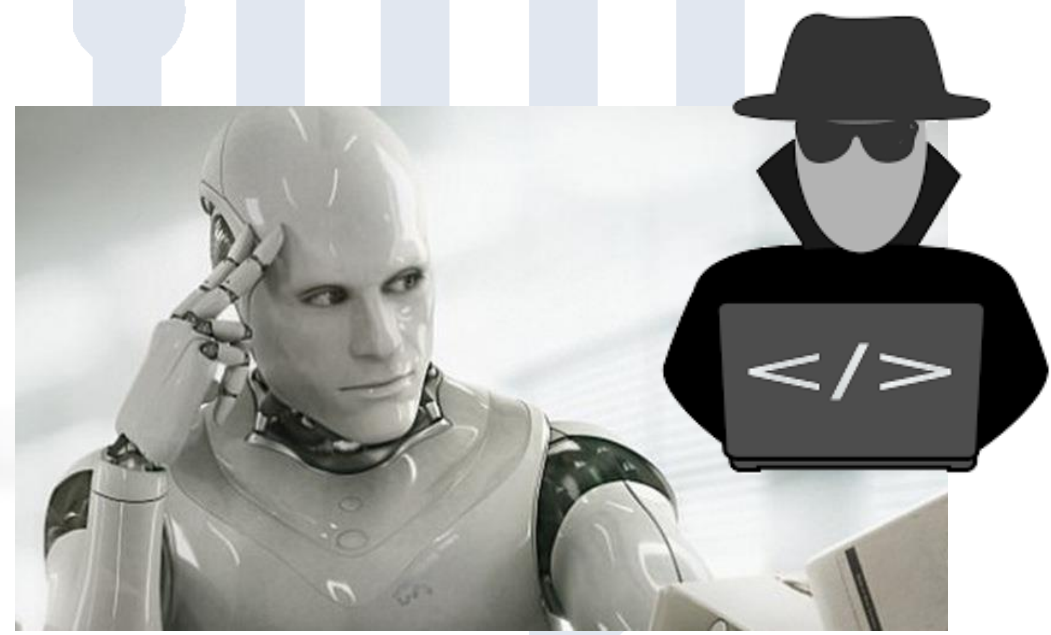


# What can be cloud sourced?



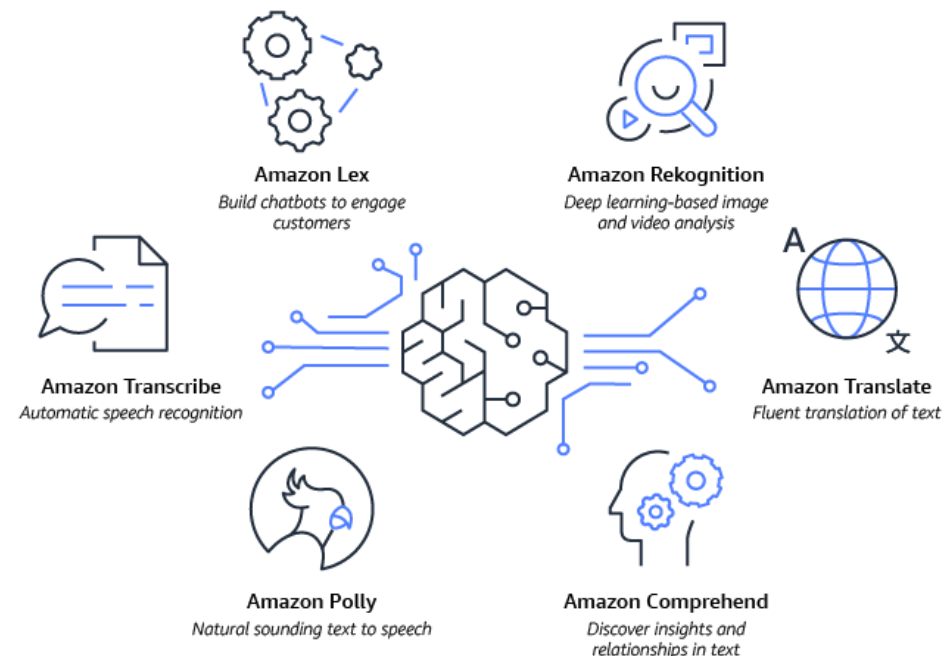
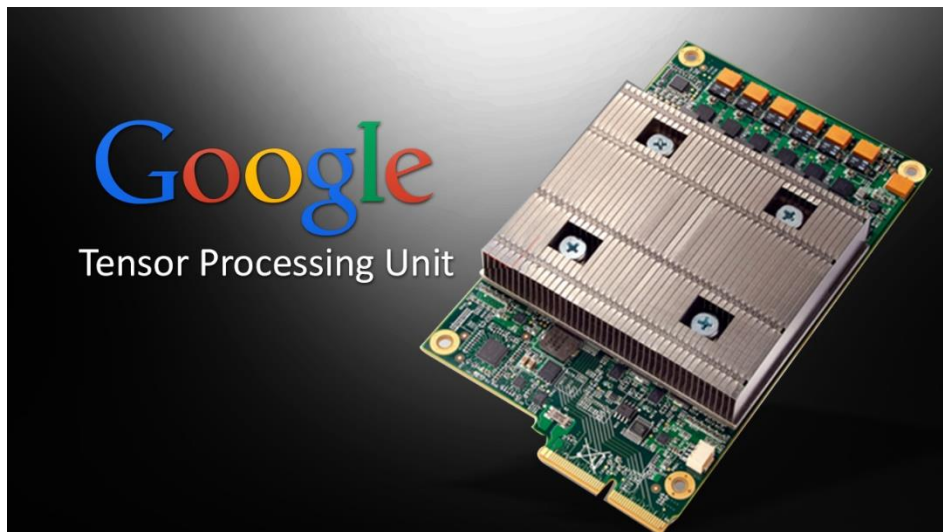
# Current bottlenecks

**Energy source**  
**Communication**  
**Cyber Security**





# New business models



amazon alexa

- "Alexa, who was President when Barack Obama was nine?"
- "Alexa, how's my commute?"
- "Alexa, what's the weather?"
- "Alexa, did the 49ers win?"





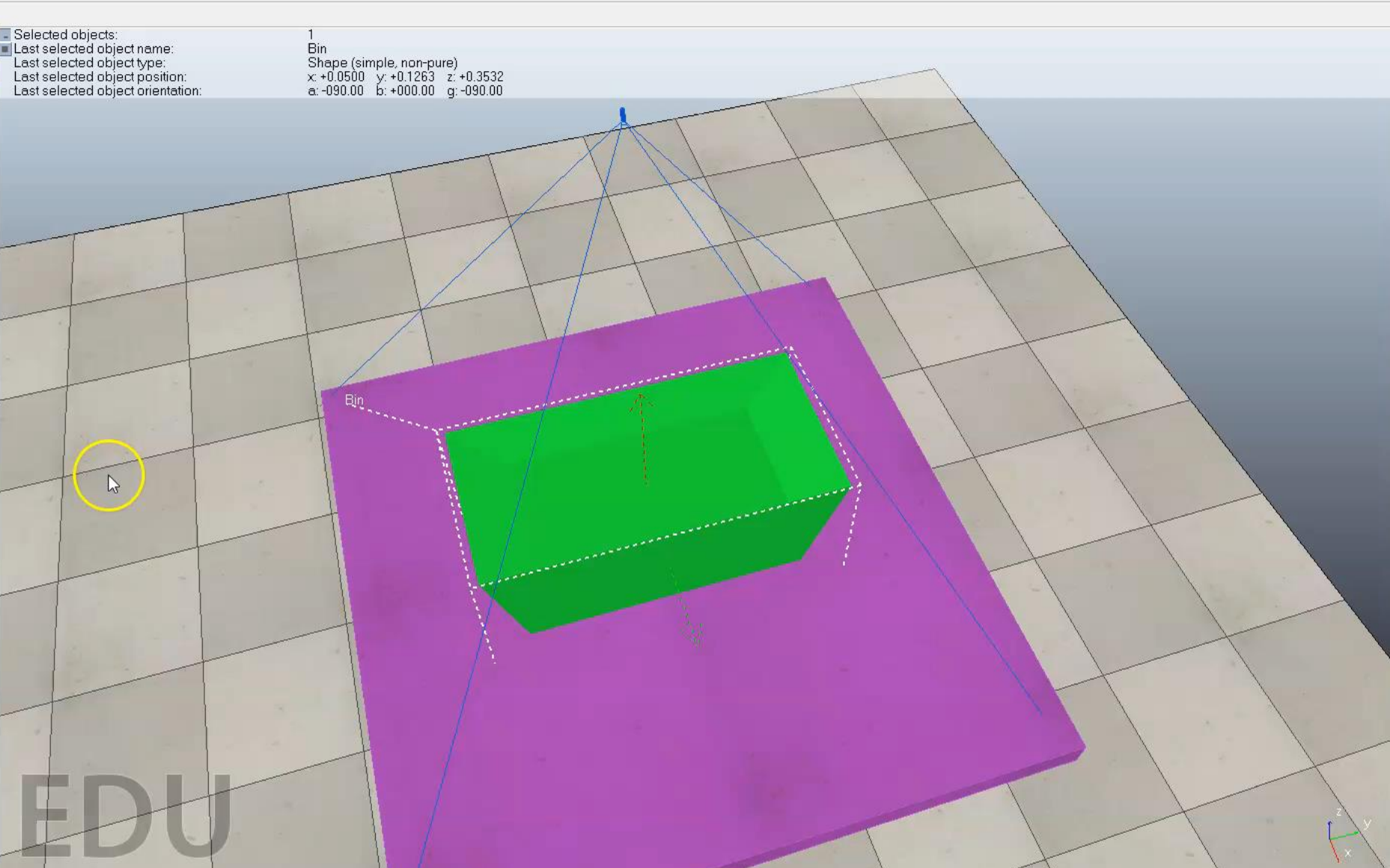
Model browser

- components
- equipment
- examples
- furniture
- household
- infrastructure
- nature
- office items
- other
- people
- robots
- tools
- vehicles

new scene binPicking

Scene hierarchy

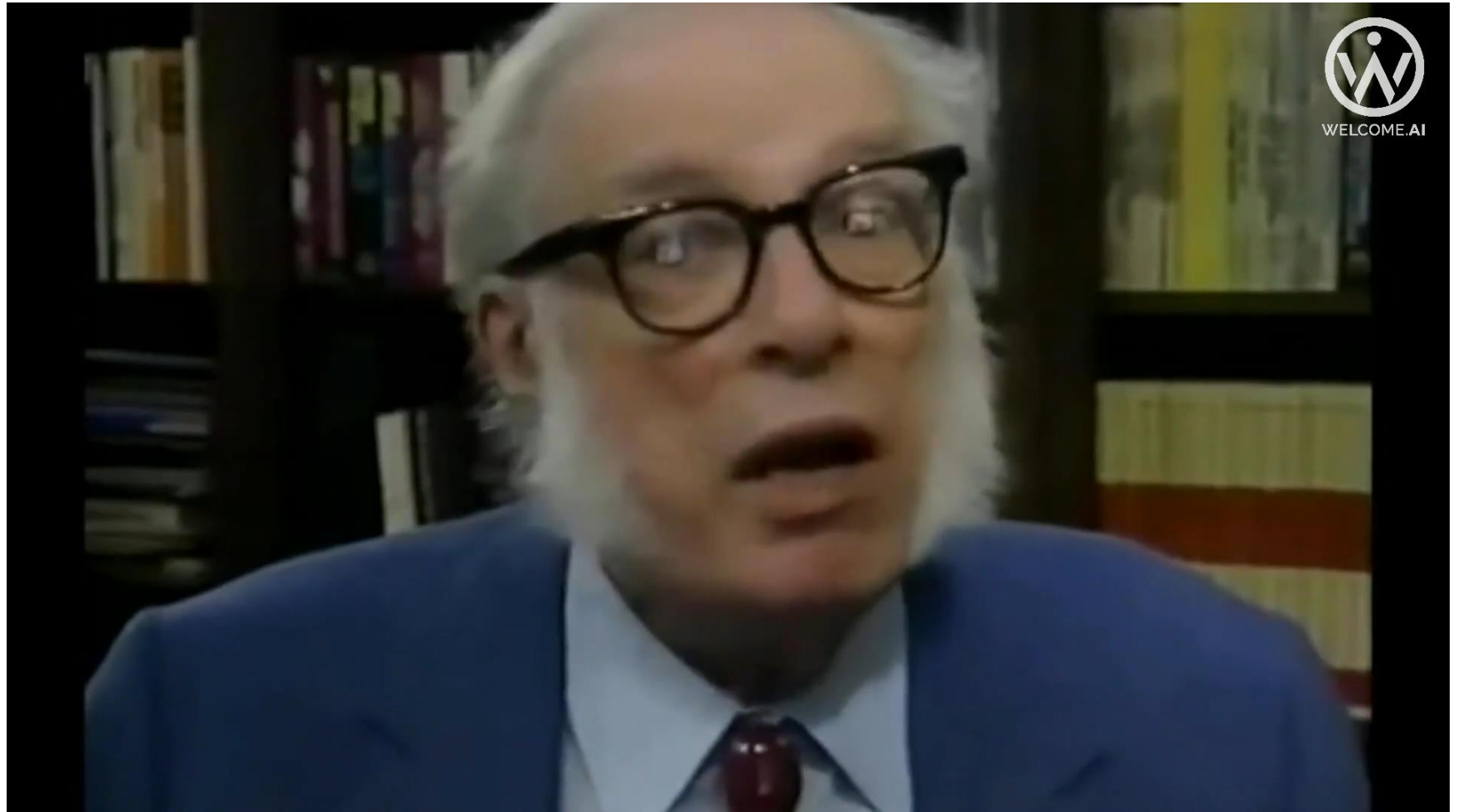
- binPicking (scene 2)
  - Bin
  - DefaultCamera
  - DefaultLightA
  - DefaultLightB
  - DefaultLightC
  - DefaultLightD
  - remoteApiCommandServer
  - Table
  - Vision\_sensor
  - ResizableFloor\_5\_25
  - XYZCameraProxy



- actuators
- grippers

simulation stopping...  
 Simulation ended (add-on script)  
 Simulation stopped.

Input Lua code here, or type "help()" (use TAB for auto-completion)



Isaac Asimov  
1984

