



ÓBUDA UNIVERSITY
IROB - ANTAL BEJCZY CENTER
FOR INTELLIGENT ROBOTICS

The Big Meeting

AI + Mechatronics

Hőnyi Gábor Pál
Robottechnikai Szakkollégium



NTP-SZKOLL-21-0034- Tehetséggondozás és szakmai
közösségépítés az OE ROSZ-ban- 3 500 000 Ft
támogatás





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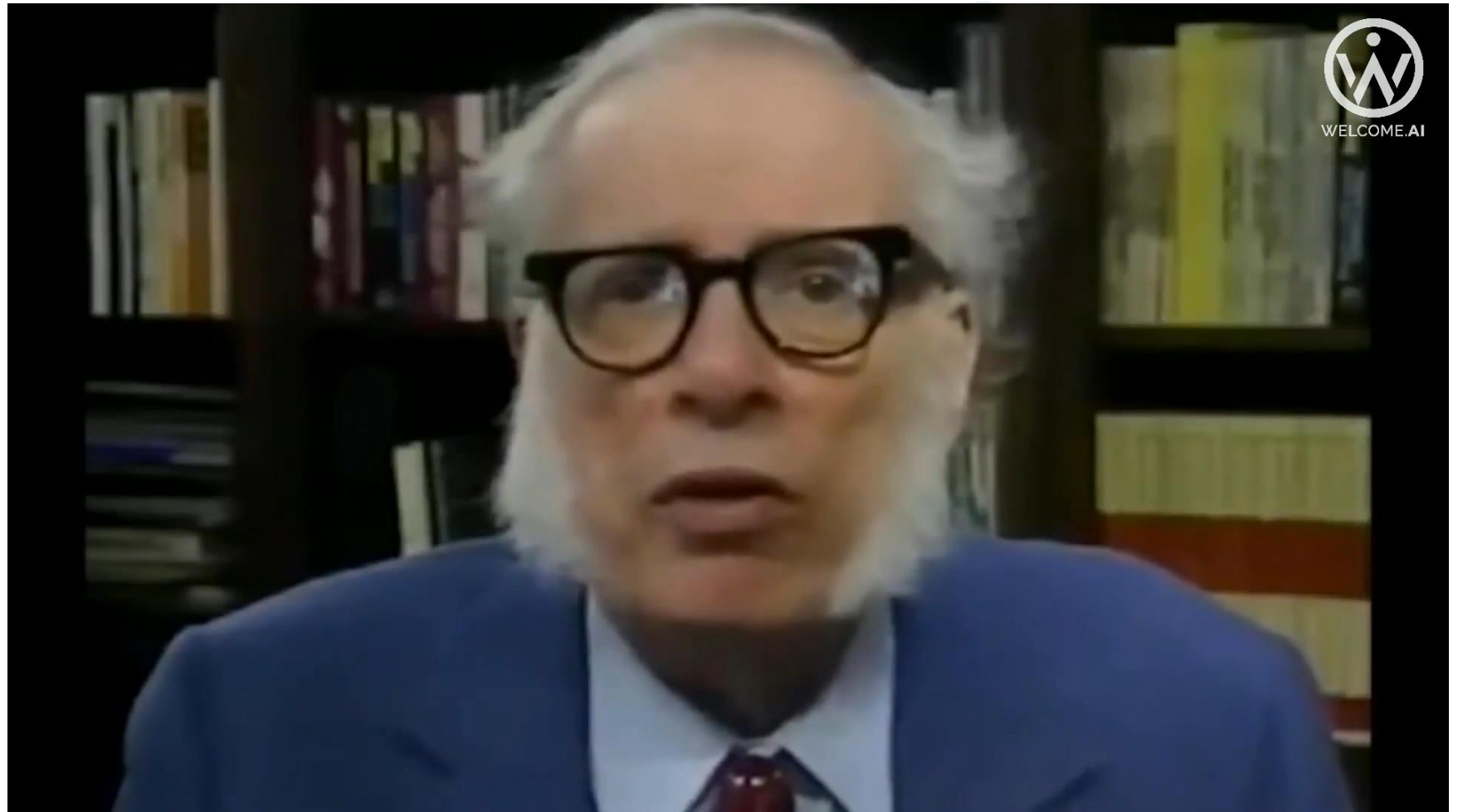
The Big Meeting

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Robottechnikai Szakkollégium



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

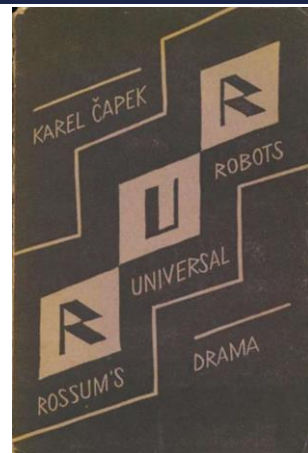


The new wave - Cobotics



Robot evolution

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

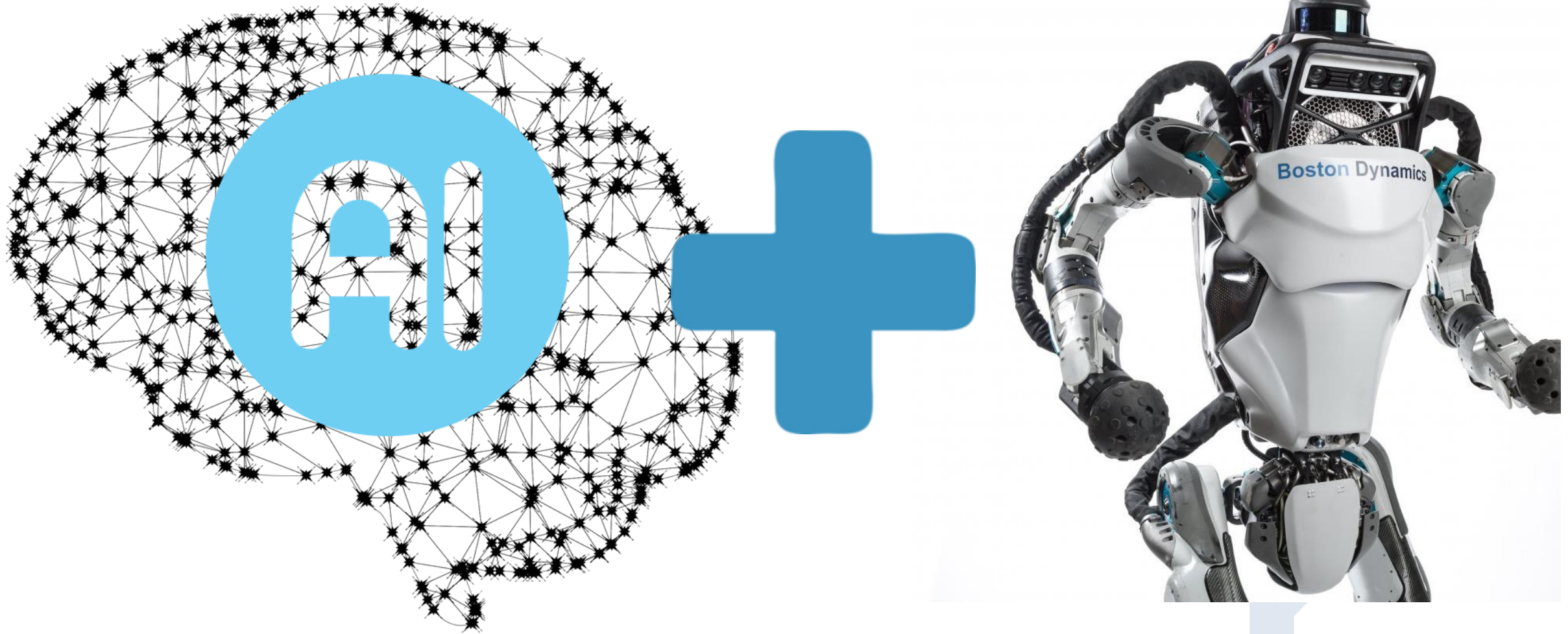


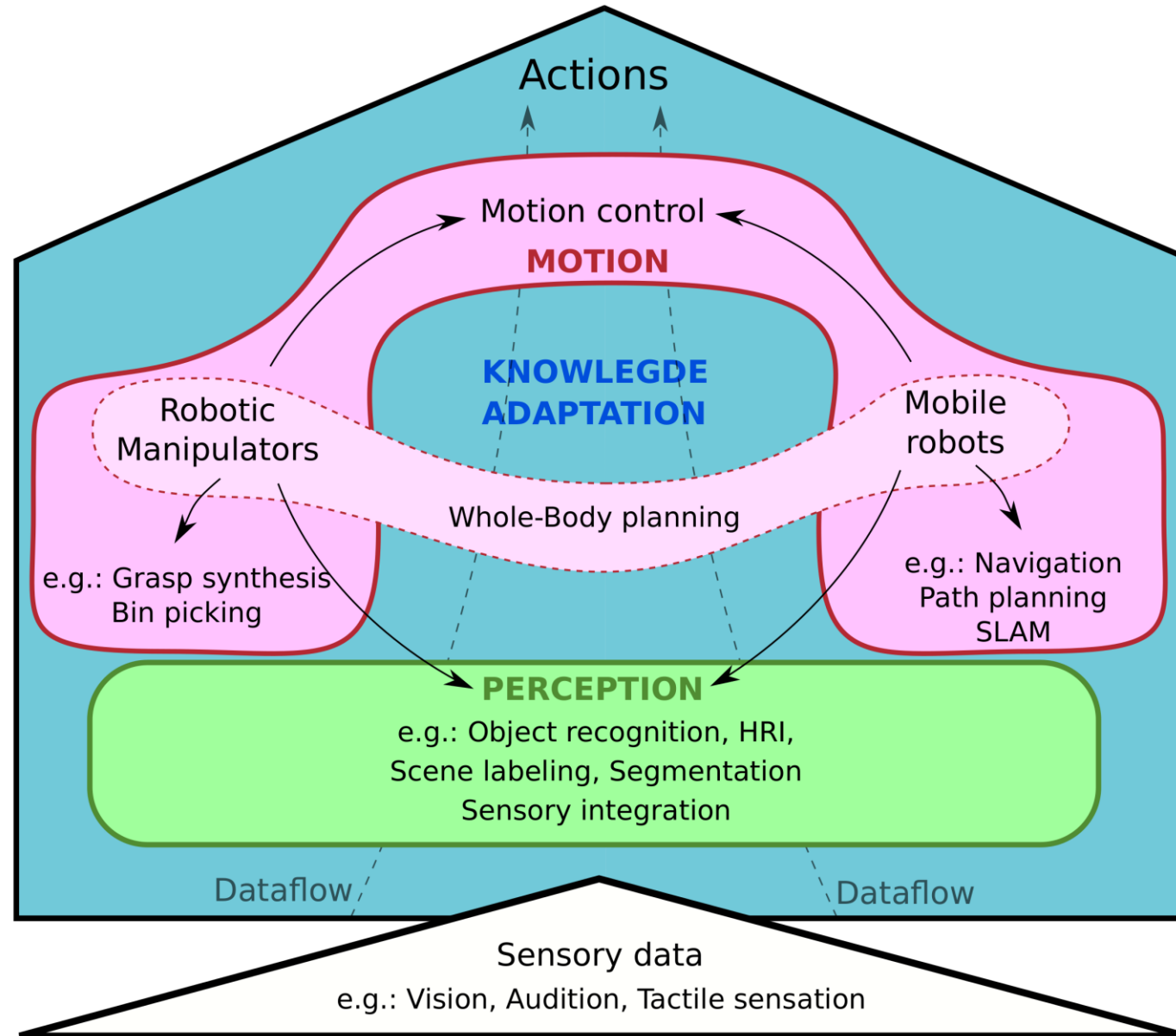
Unimate 2000 series Robot

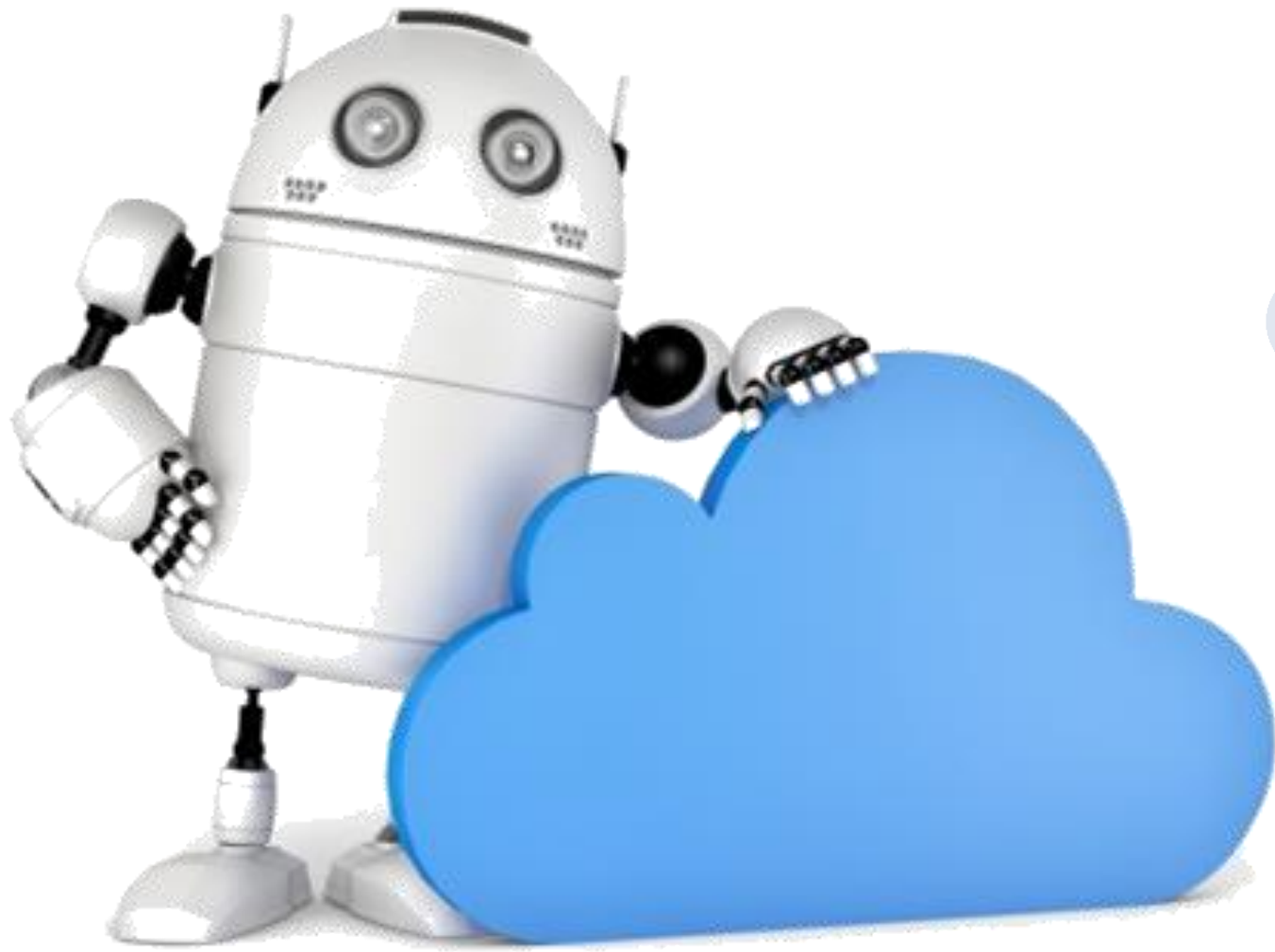


What is Robot?









CONVENTIONAL
ROBOTICS



**All functions are
on-board**

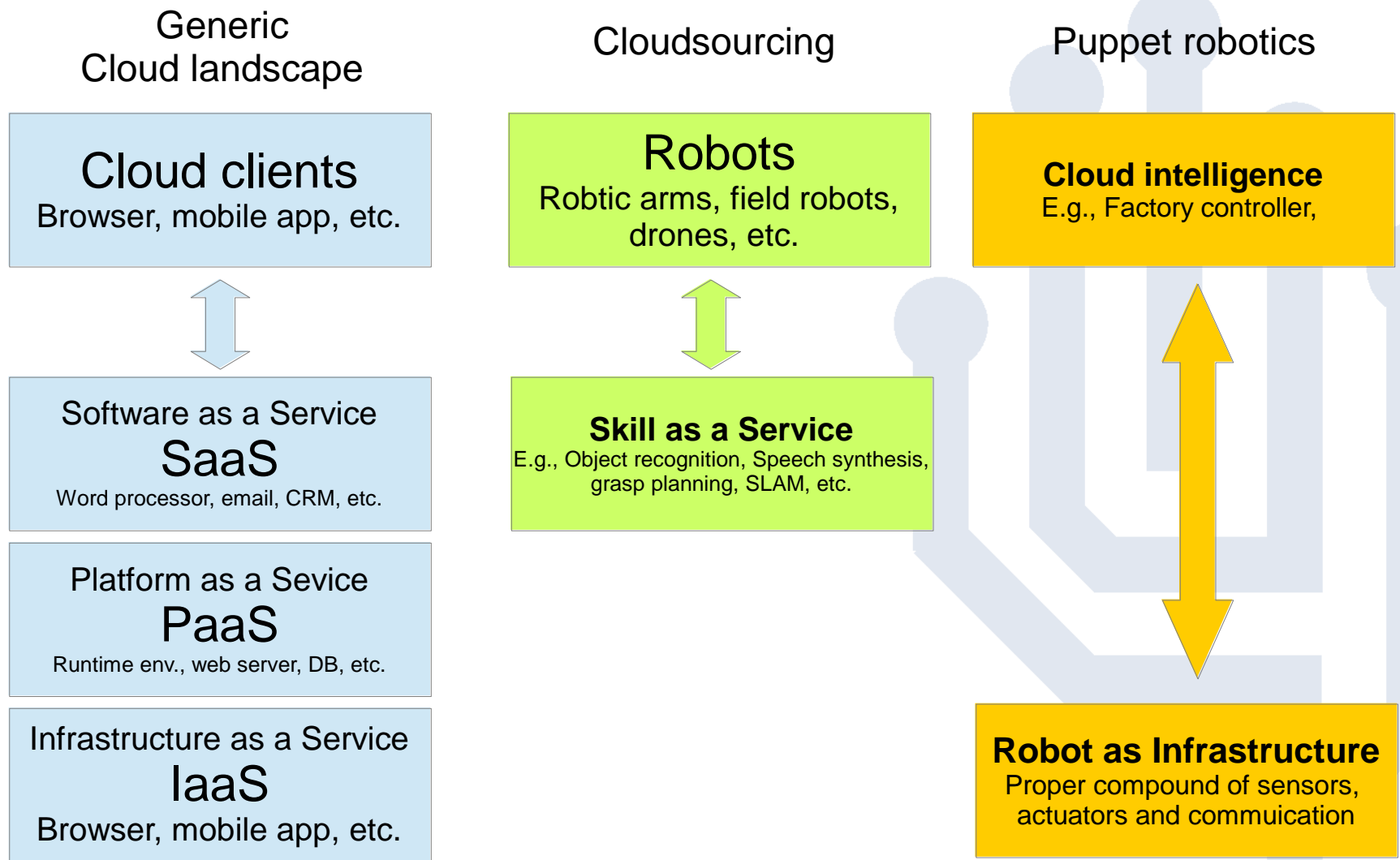
CLOUD ROBOTICS



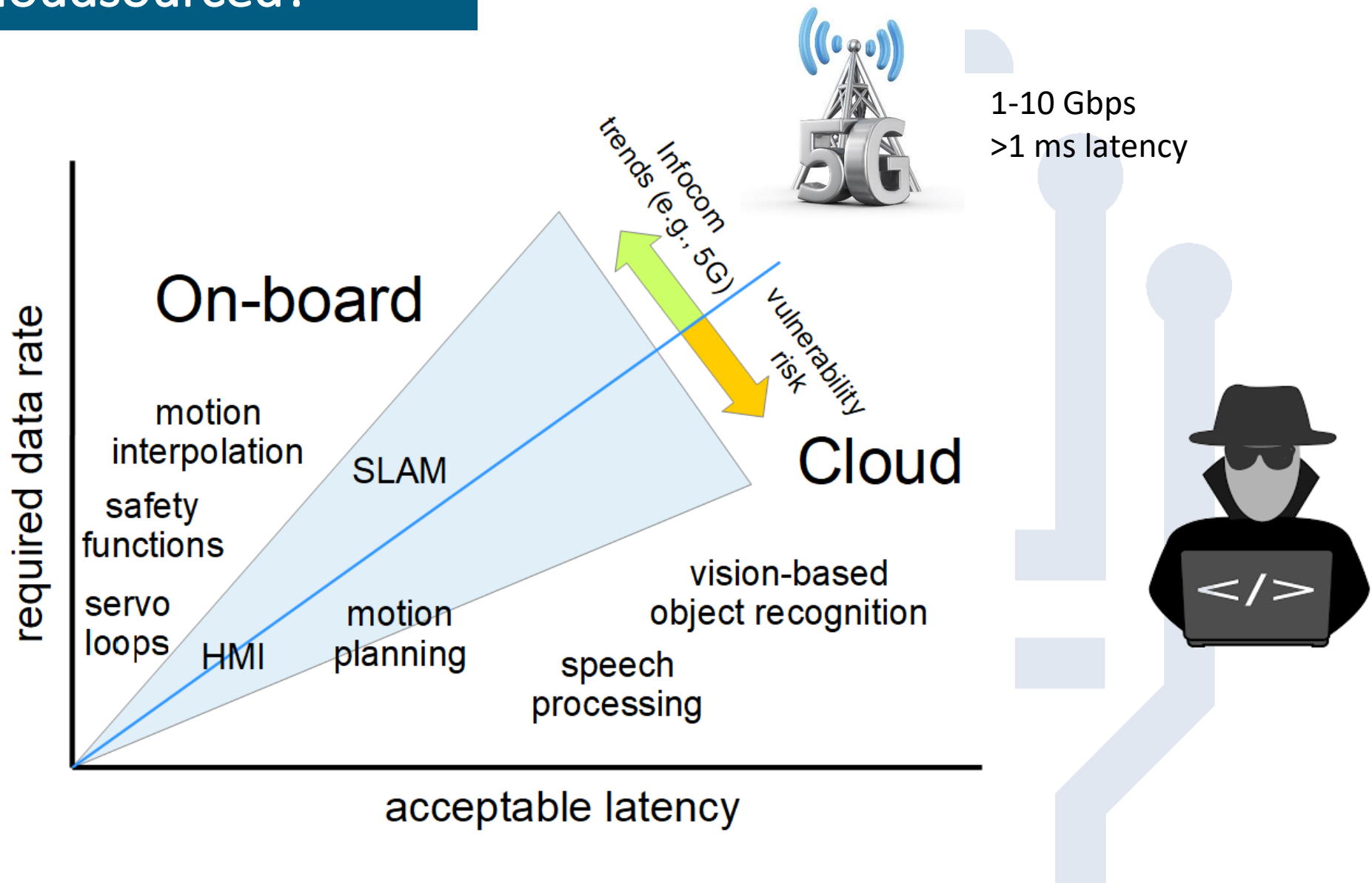
**Only sensing and
actuation onboard**

PUPPET
ROBOTS

Internet of skills

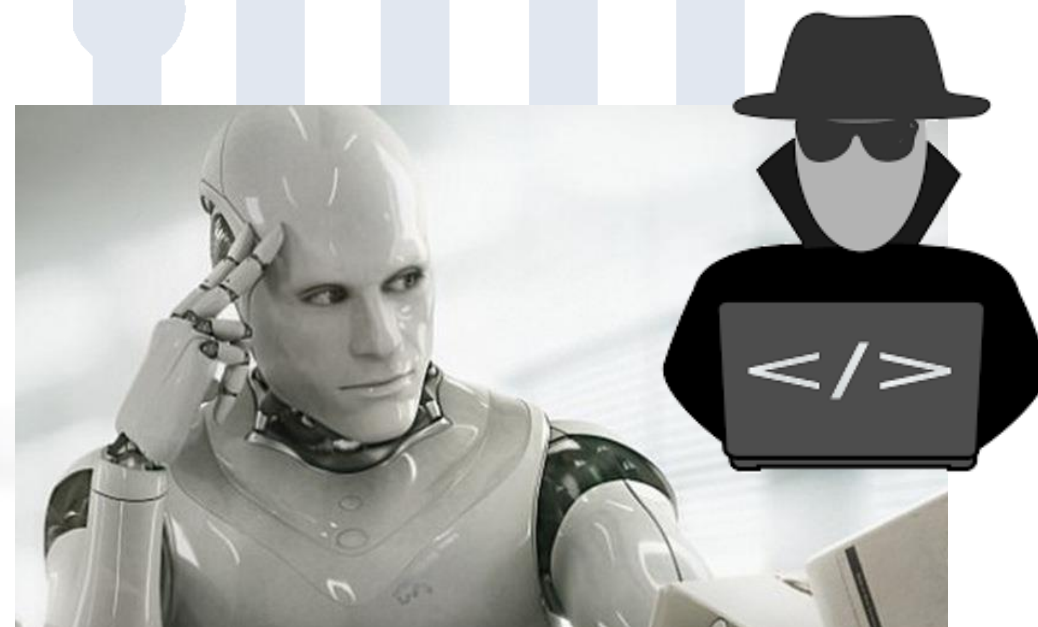


What can be cloud sourced?

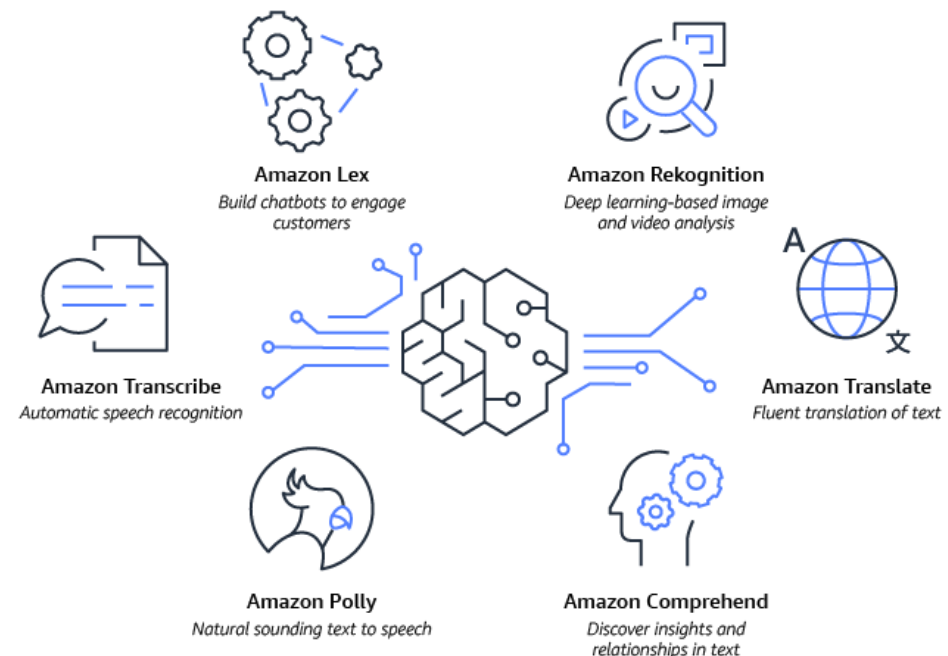
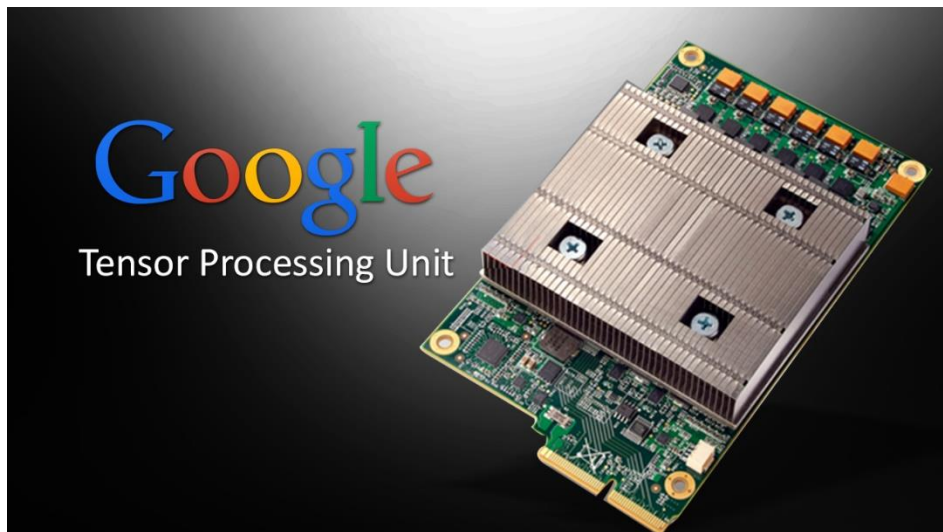


Current bottlenecks

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?"





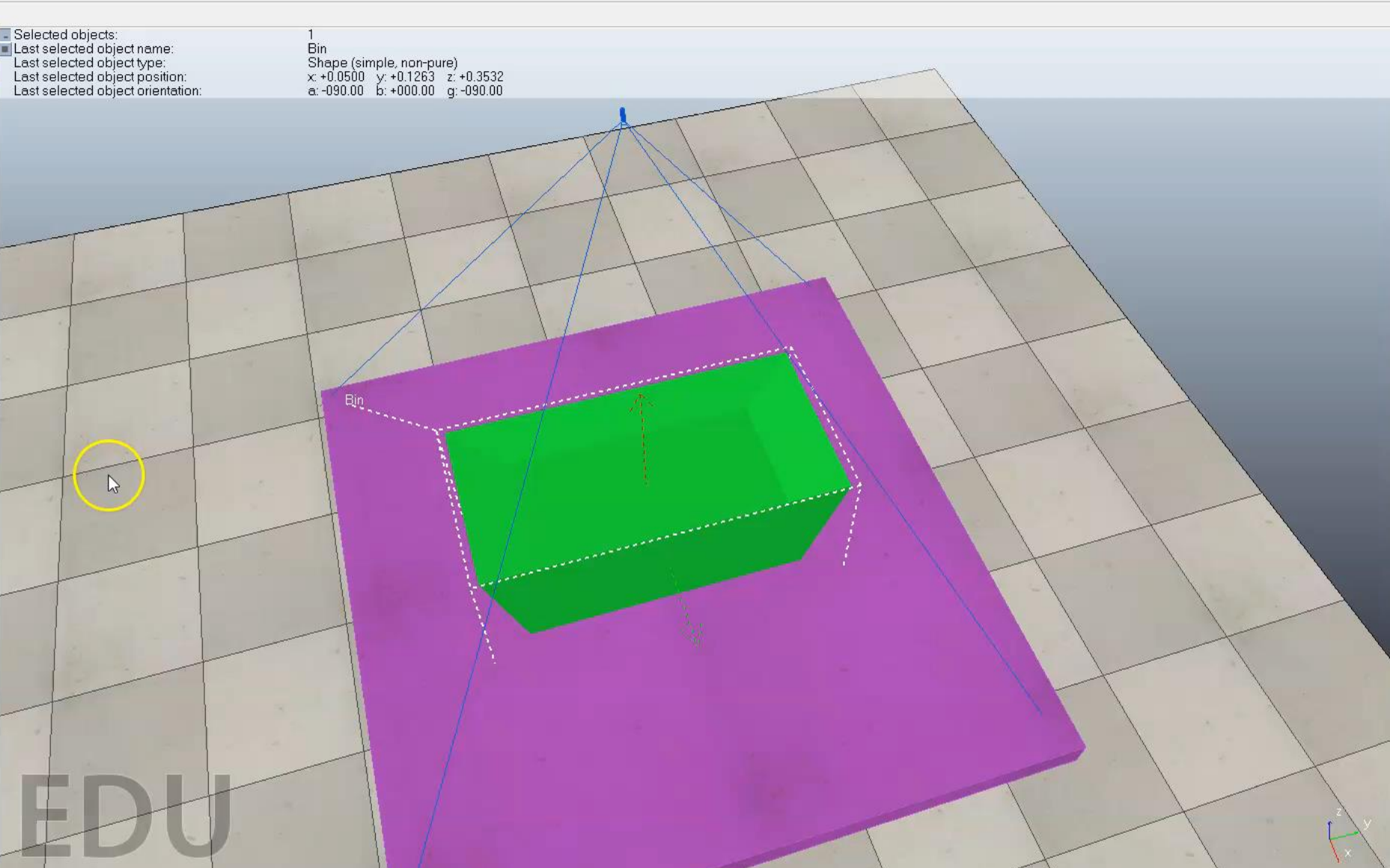
Model browser

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

new scene binPicking

Scene hierarchy

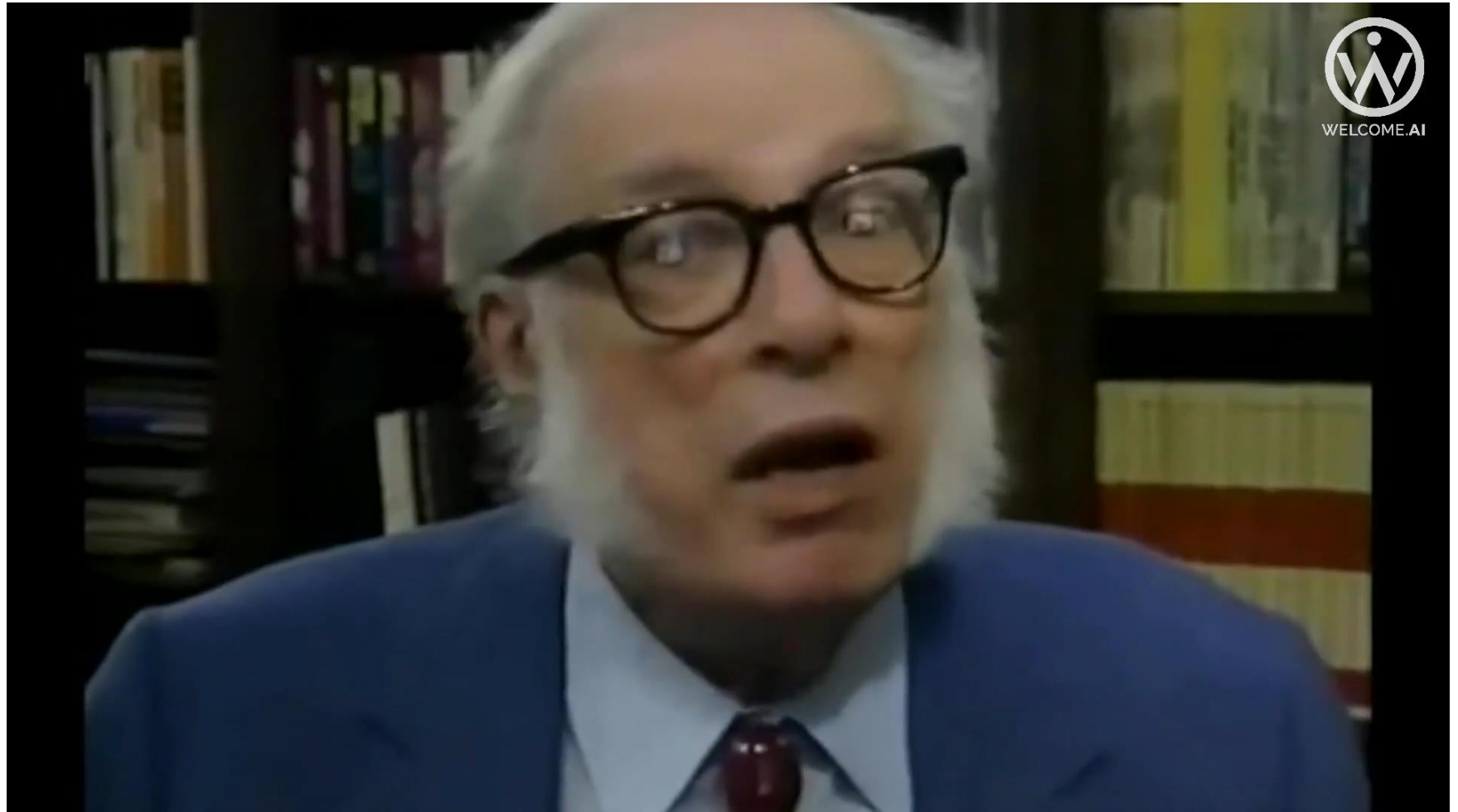
- binPicking (scene 2)
 - Bin
 - DefaultCamera
 - DefaultLightA
 - DefaultLightB
 - DefaultLightC
 - DefaultLightD
 - remoteApiCommandServer
 - Table
 - Vision_sensor
 - ResizableFloor_5_25
 - XYZCameraProxy



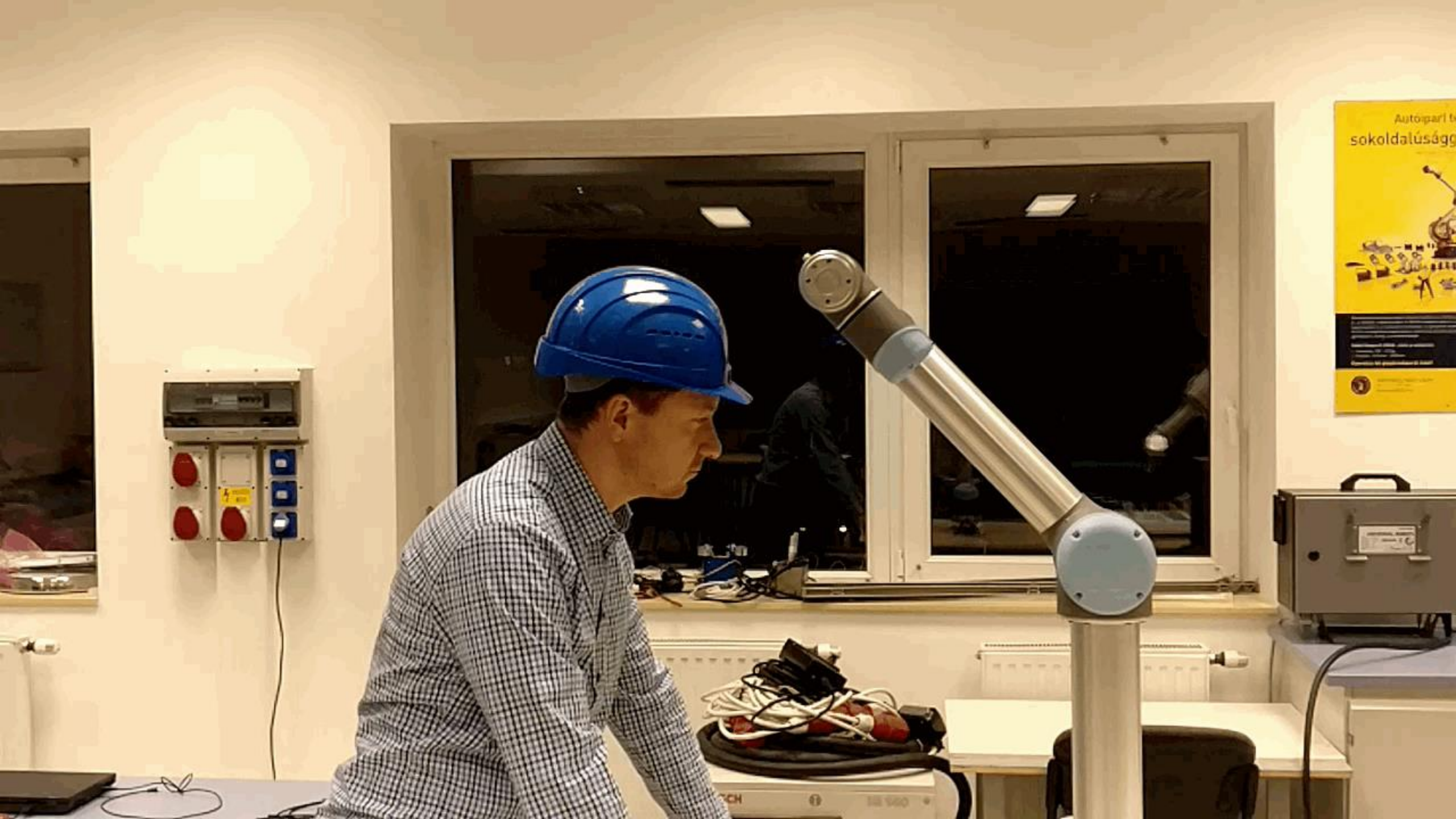
- actuators
- grippers

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

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



Isaac Asimov
1984



Autóipari b
sokoldalúságo

