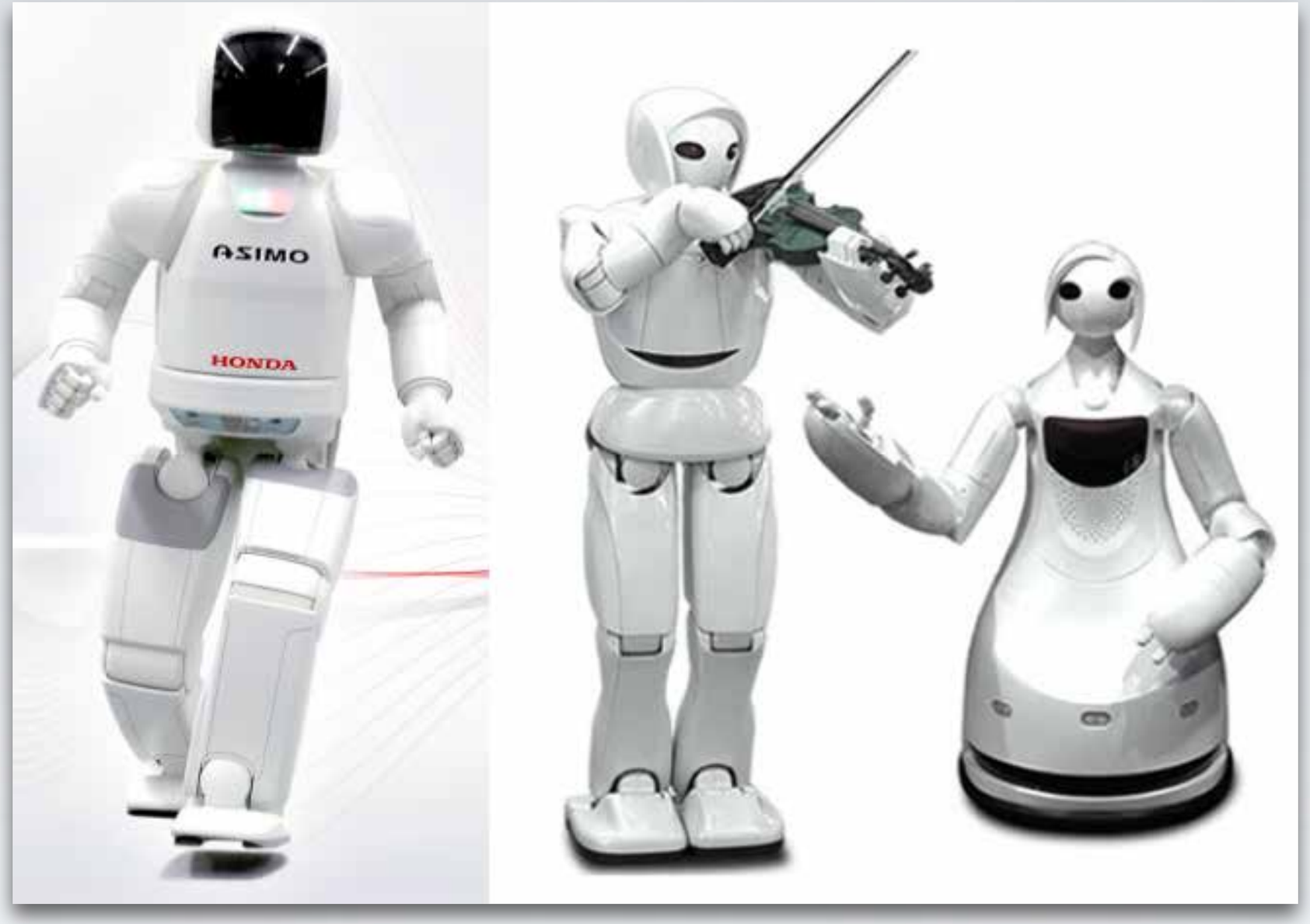

HONDA ASIMO AND TOYOTA PARTNER ROBOT

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AGENDA

- Details about Honda ASIMO
- Details about Toyota Partner Robot
- Differences between two robots
- Future developments
- Pros and Cons
- Alternatives
- Q&A

HONDA ASIMO

Honda's **A**dvanced **S**tep in **I**nnovative **MO**bility

EARLY MODELS

in 1986


HONDA

ASIMO

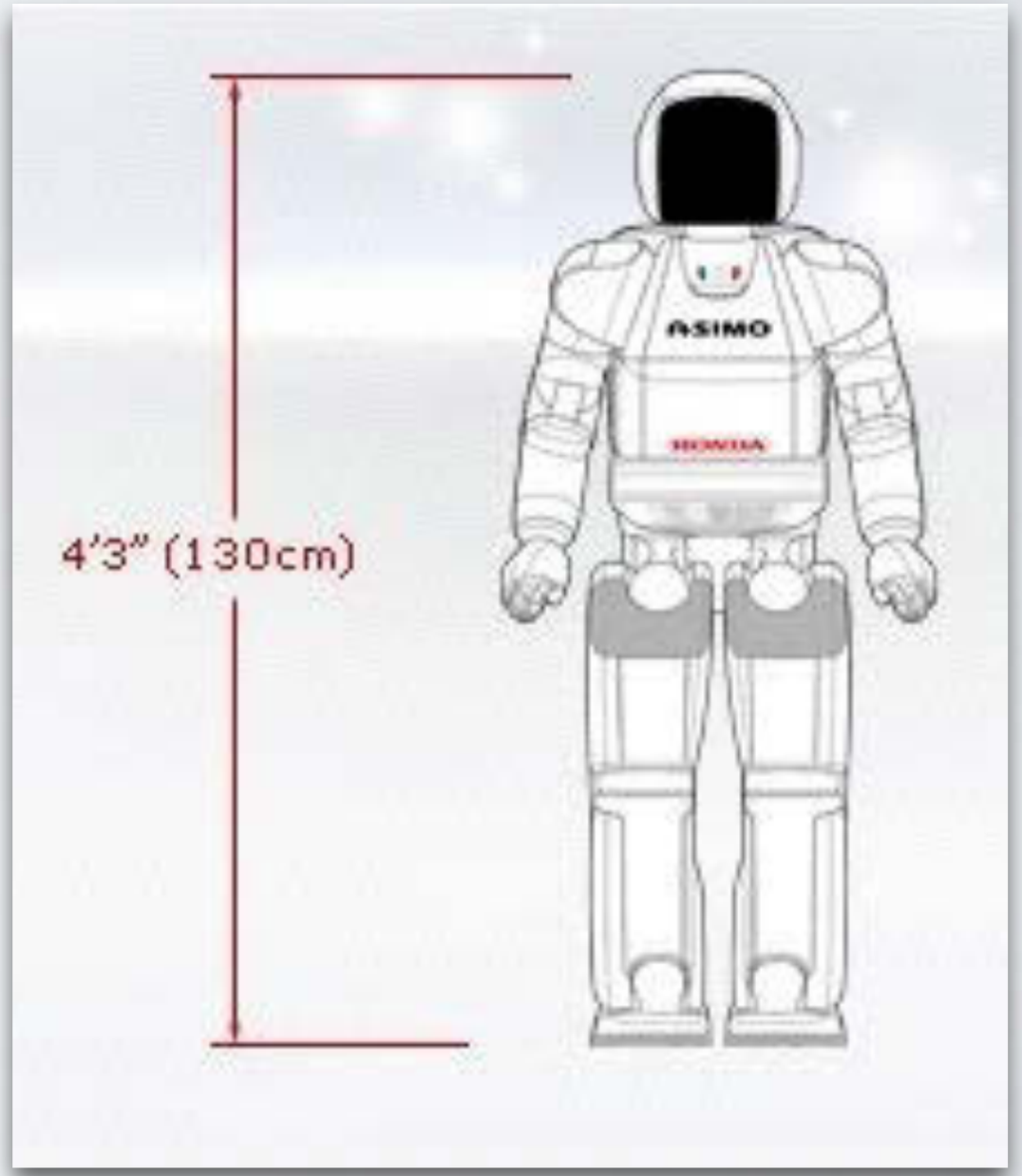
http://www.honda.co.jp/ASIMO/

SPECIFICATION

of Honda ASIMO

SPECIFICATION

- Height: 130cm
- Weight: 50kg
- Walking Speed: 2.7km/h
- Grasping Force: 0.5kg/hand
- Power: Rechargeable 51.8V Lithium Ion Battery
- Operating time: 1 hour
- Composition: Magnesium alloy covered with a plastic resin



SPECIFICATION

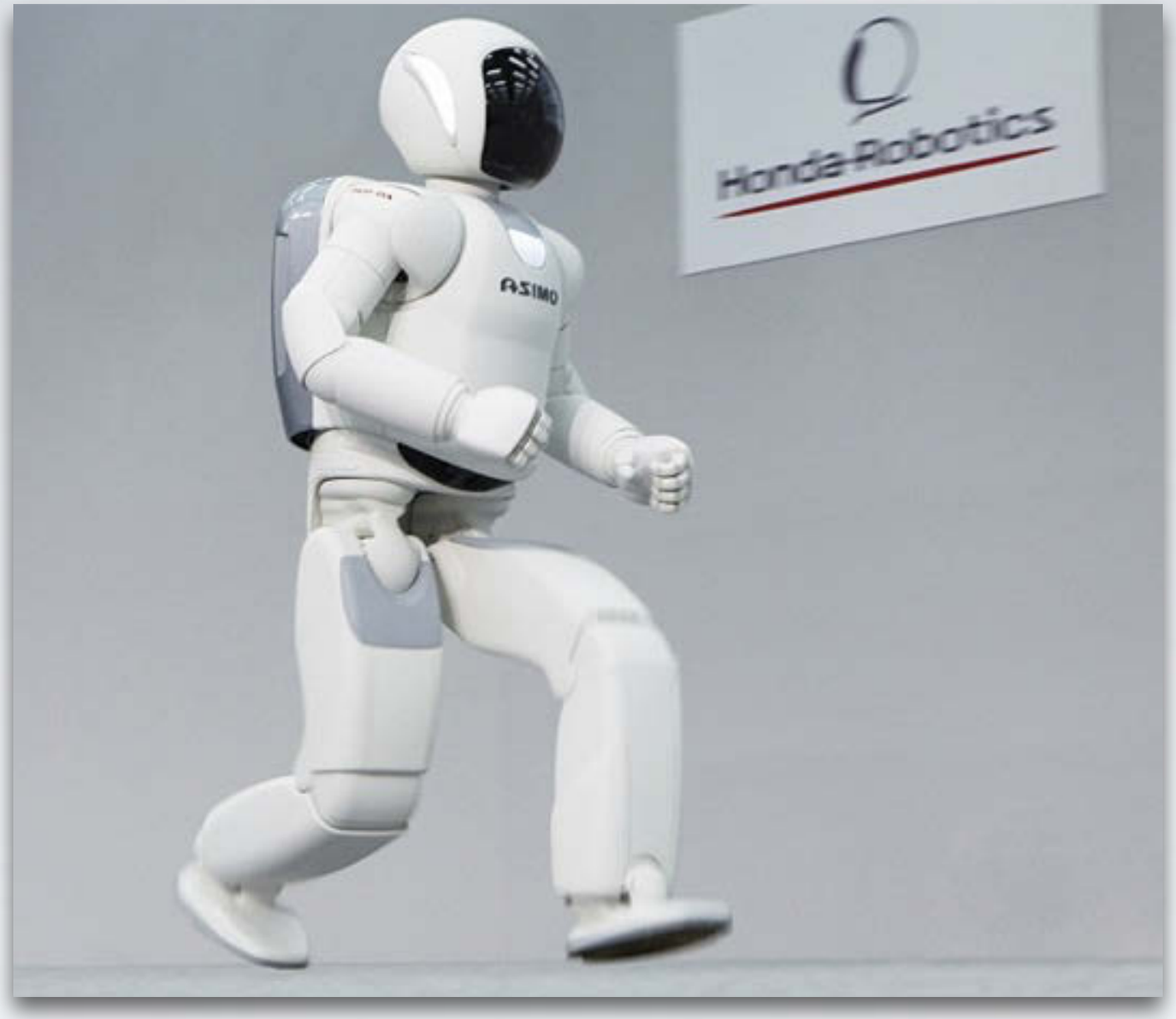
DEGREES OF FREEDOM (for human joints)		
HEAD	Neck joint (Up/Down, Left/Right Rotation)	3 DOF
ARMS	Shoulder joints (Forward/Backward, Up/Down Rotation)	3 DOF
	Elbow joints (Forward/Backward)	1 DOF
	Wrist joints (Up/Down, Left/Right, Rotation)	14 DOF
HANDS	4 fingers (to grasp objects) / Thumb	26 DOF
HIP	Rotation	2 DOF
LEGS	Crotch joint (Forward/Backward, Left/Right Rotation)	3 DOF
	Knee joints (Forward/Backward)	1 DOF
	Ankle joints (Forward/Backward, Left/Right Rotation)	12 DOF
TOTAL		**57 DOF**

INDICATOR LIGHTS

- **Green**: low-level power on
- **White**: ready for operation
- **Red**: ready to walk

POWER SOURCE

- Rechargeable
- 51.8 V Li-ION battery
- about 13 pounds



MOVEMENT

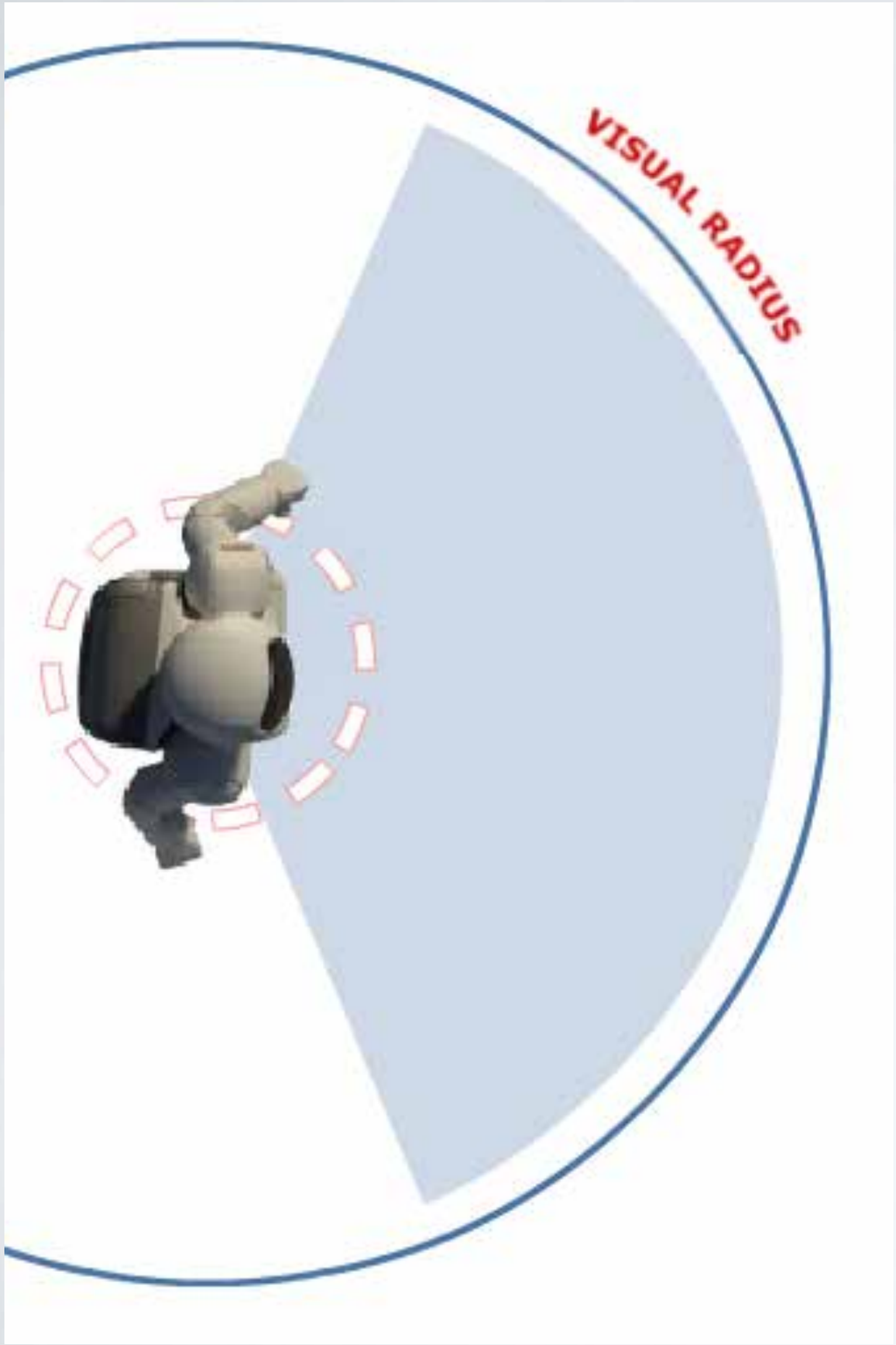
of Honda ASIMO

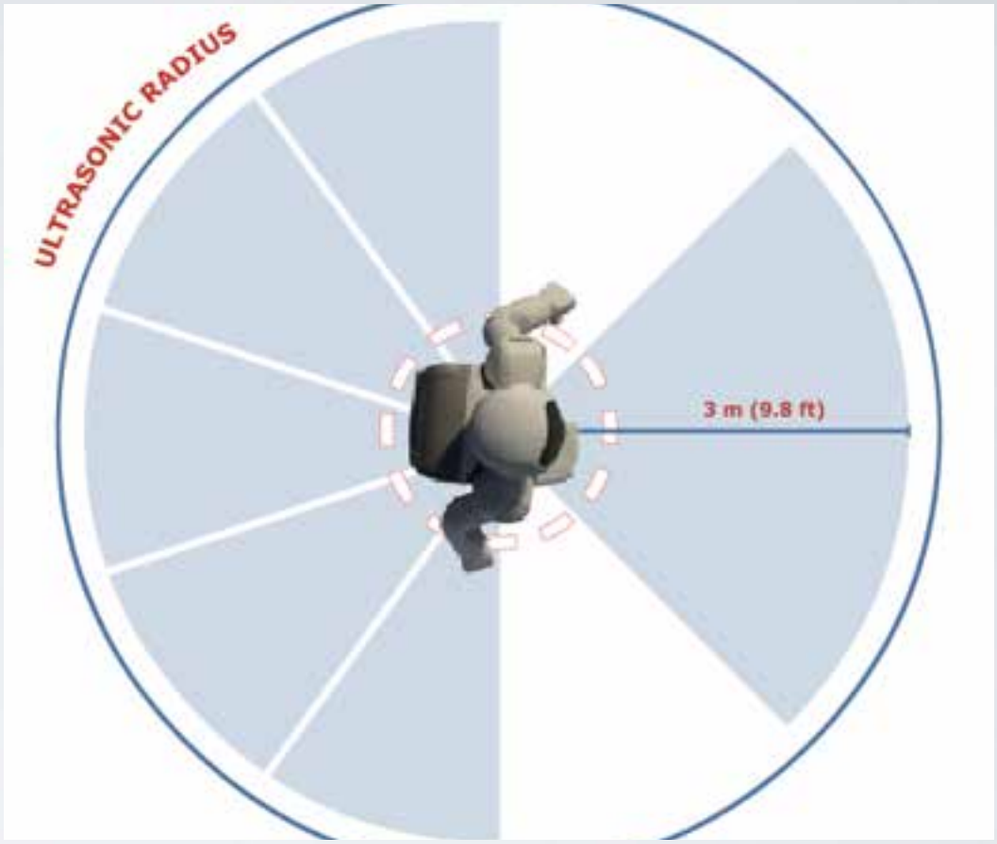
WALKING/RUNNING

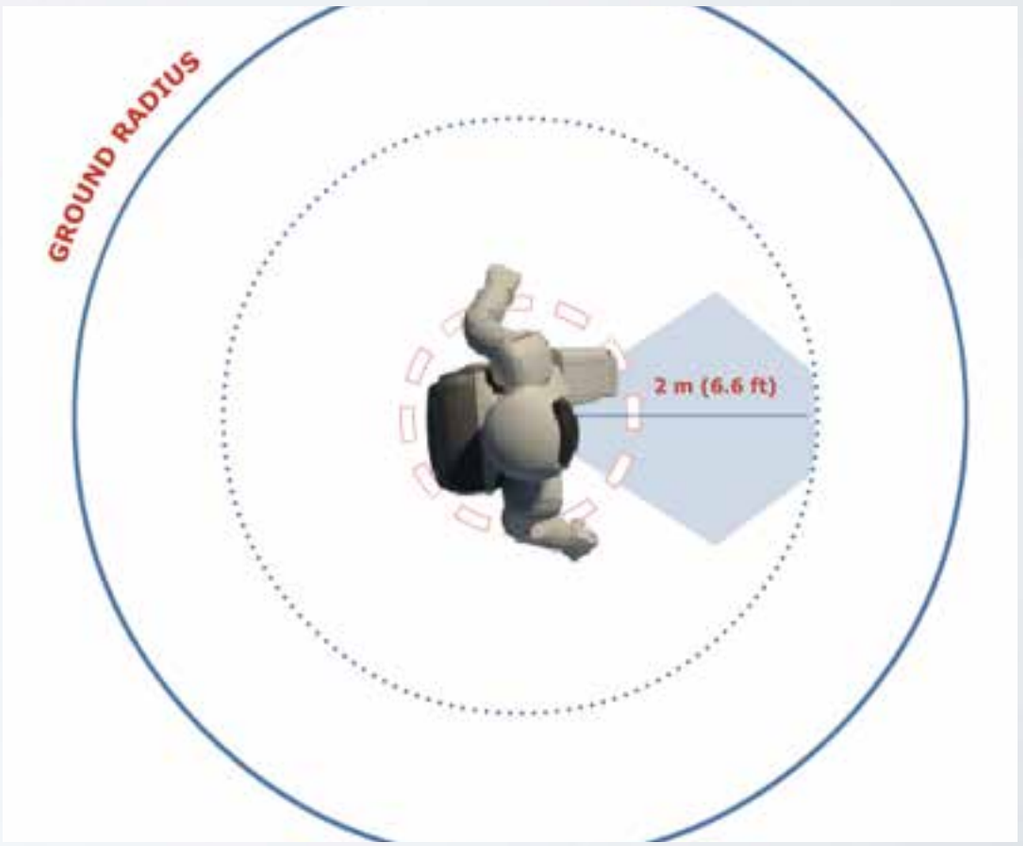
- Very stable
- Stored walking patterns
  - Acceleration
  - Steady speed
  - Deceleration
  - Turning
- Able to run in a circular pattern at high speeds

AVOIDING OBSTACLES

- Ultrasonic sensor
- Ground Sensor
- Visual Sensor


VISUAL RADIUS


ULTRASONIC RADIUS
3 m (9.8 ft)

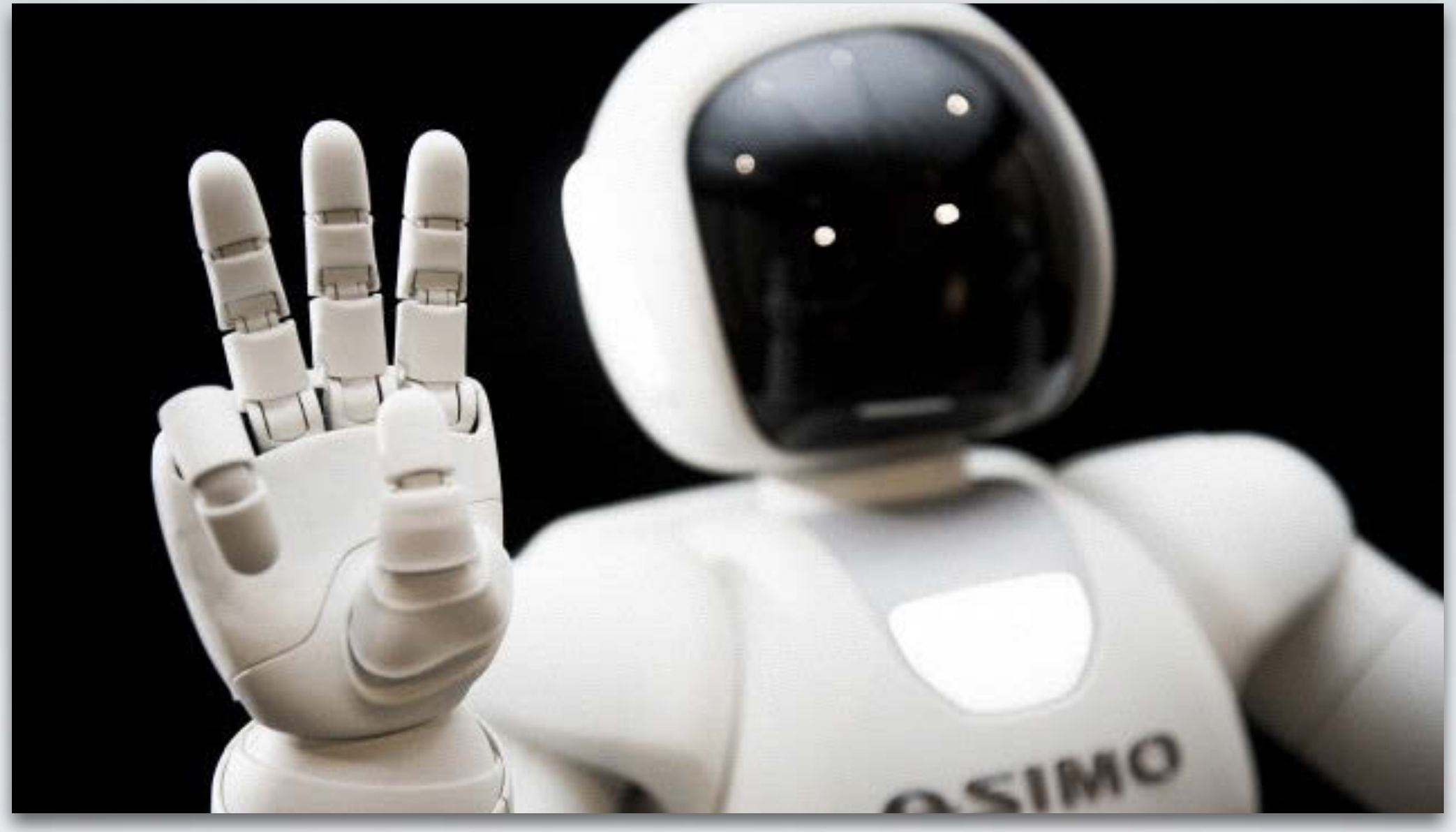

GROUND RADIUS
2 m (6.6 ft)

CLIMBING/DESCENDING

- i-WALK
  - Intelligent Real-Time Flexible Walking

- Environment recognition


Honda Robotics
ASIMO
HONDA'S ALL-NEW ASIMO



FUNCTIONS AND INTELLIGENCE

of Honda ASIMO

INTELLIGENCE

- Charting a route
- Recognizing moving objects
- Distinguishing sounds
- Recognizing Faces and gestures

PUSHING A CART

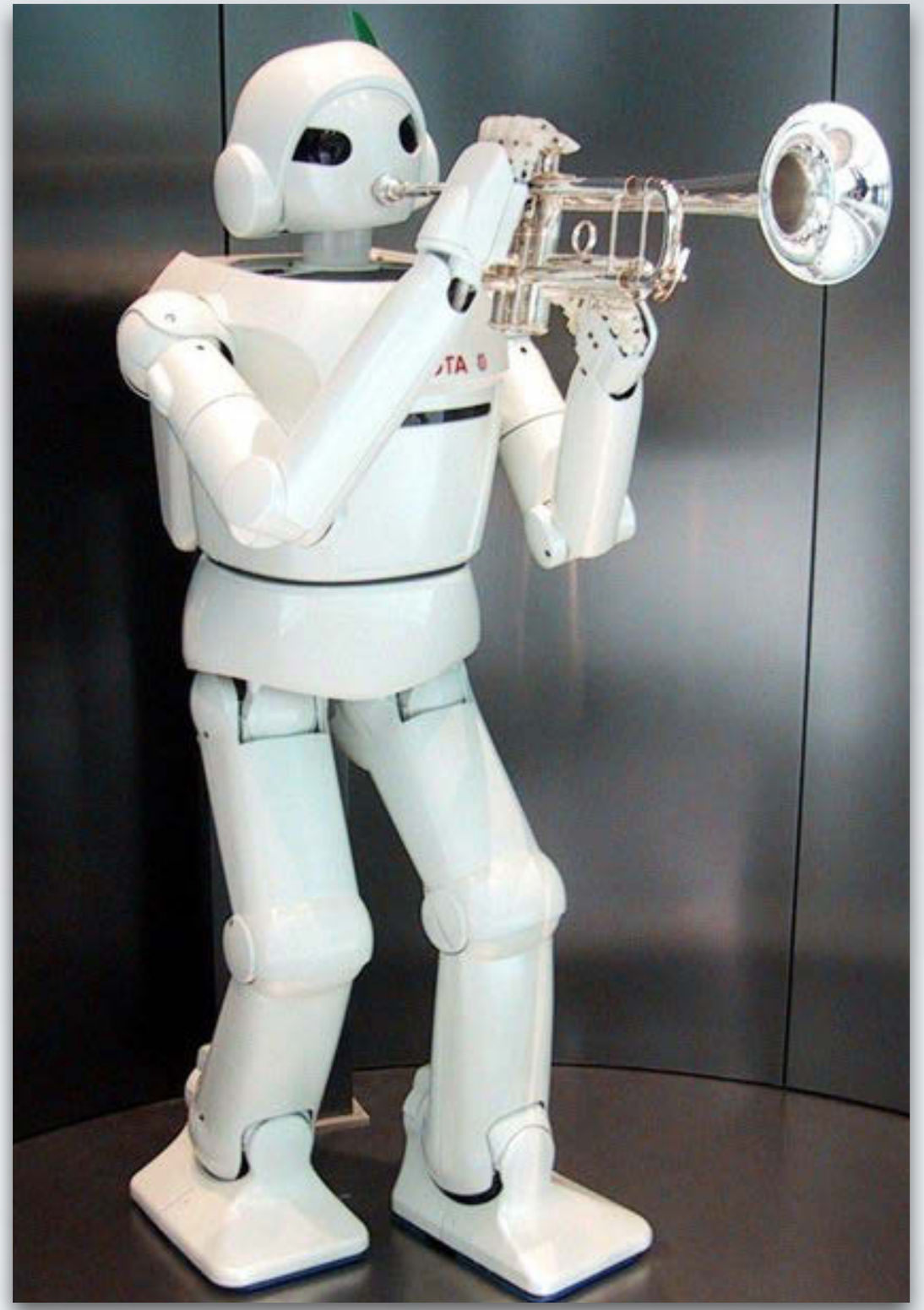
- Adjust the force of arms
- By force sensor in wrists

CARRYING A TRAY

- Detect movement of a person
- Move in synchronisation
- Uses entire body to control the tray

TOYOTA PARTNER ROBOT

developed by Toyota

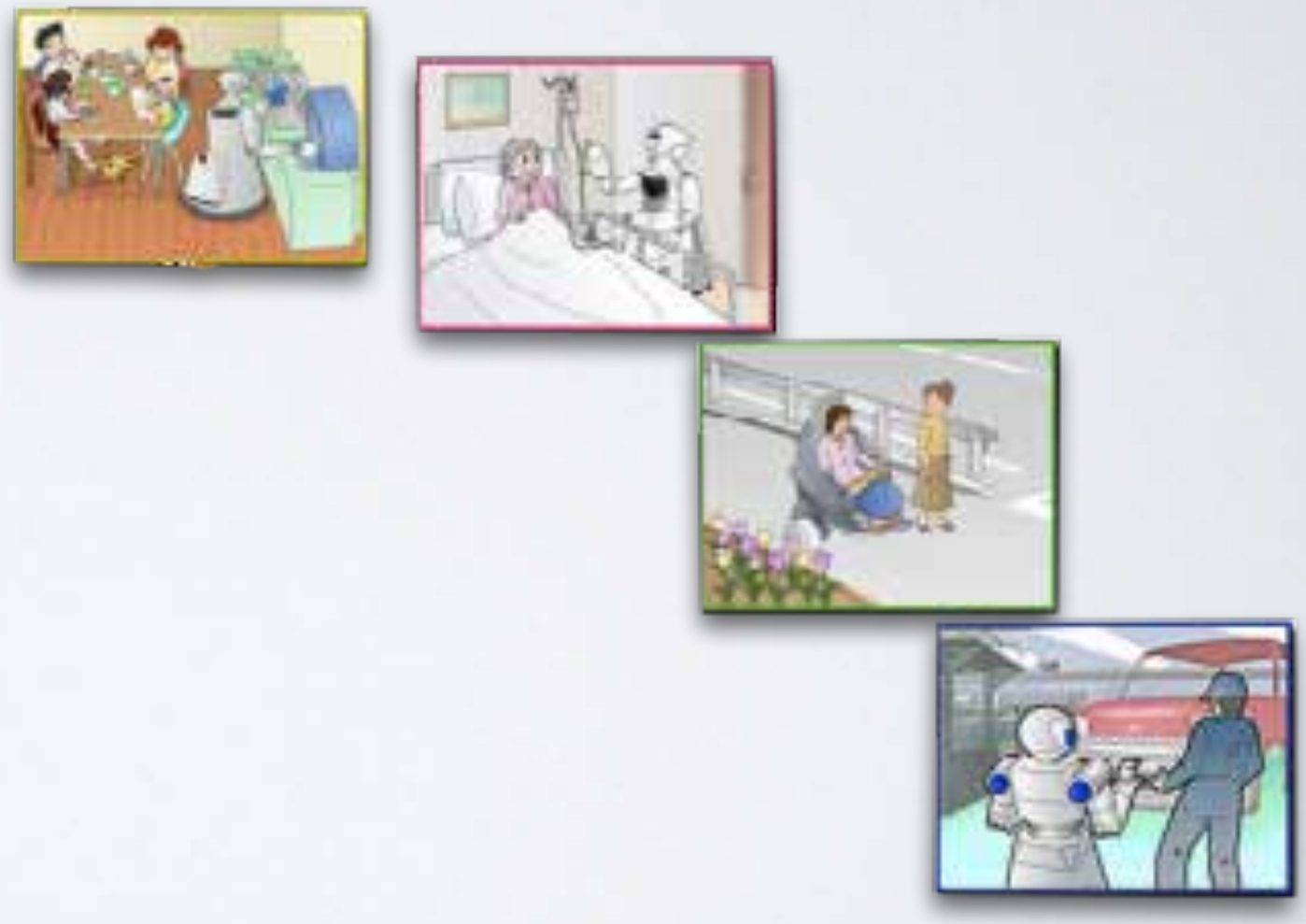


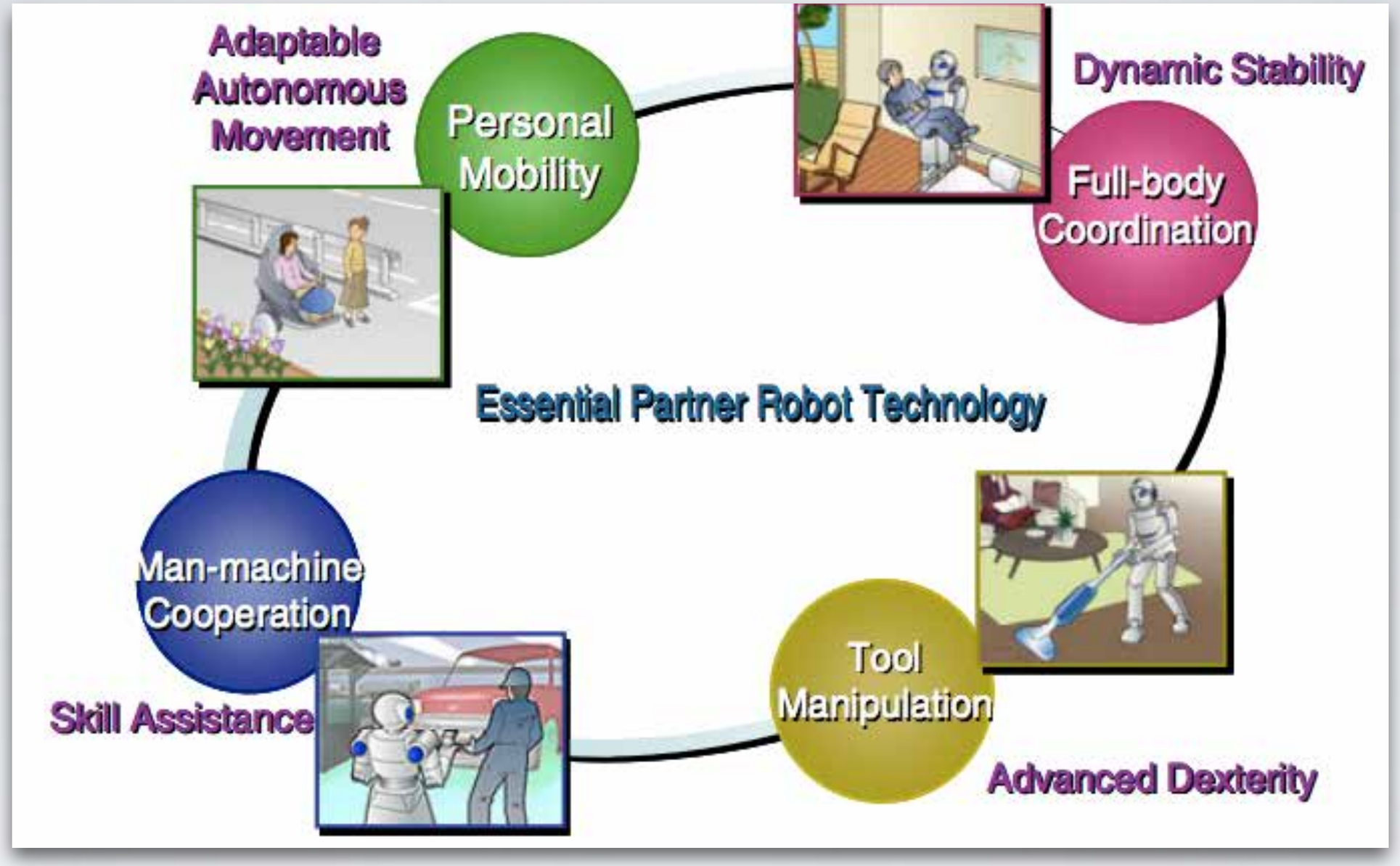
START DEVELOPMENT

in 2000

ROBOT DEVELOPMENT AREA

- Manufacturing Support
- Short-distance Personal Mobility
- Nursing and Healthcare Support
- Support for Work around the Home





ESSENTIAL ROBOT TECHNOLOGY


Human Support Robot(HSR)


Walk Assist Robot
Care Assist Robot

SPECIFICATION

of Toyota Partner Robot

HUMAN SUPPORT ROBOT

- Release: 2012
- Body diameter: 370mm
- Body height: 830 mm - 1,330 mm
- Weight: 32kg

WALK ASSIST ROBOT

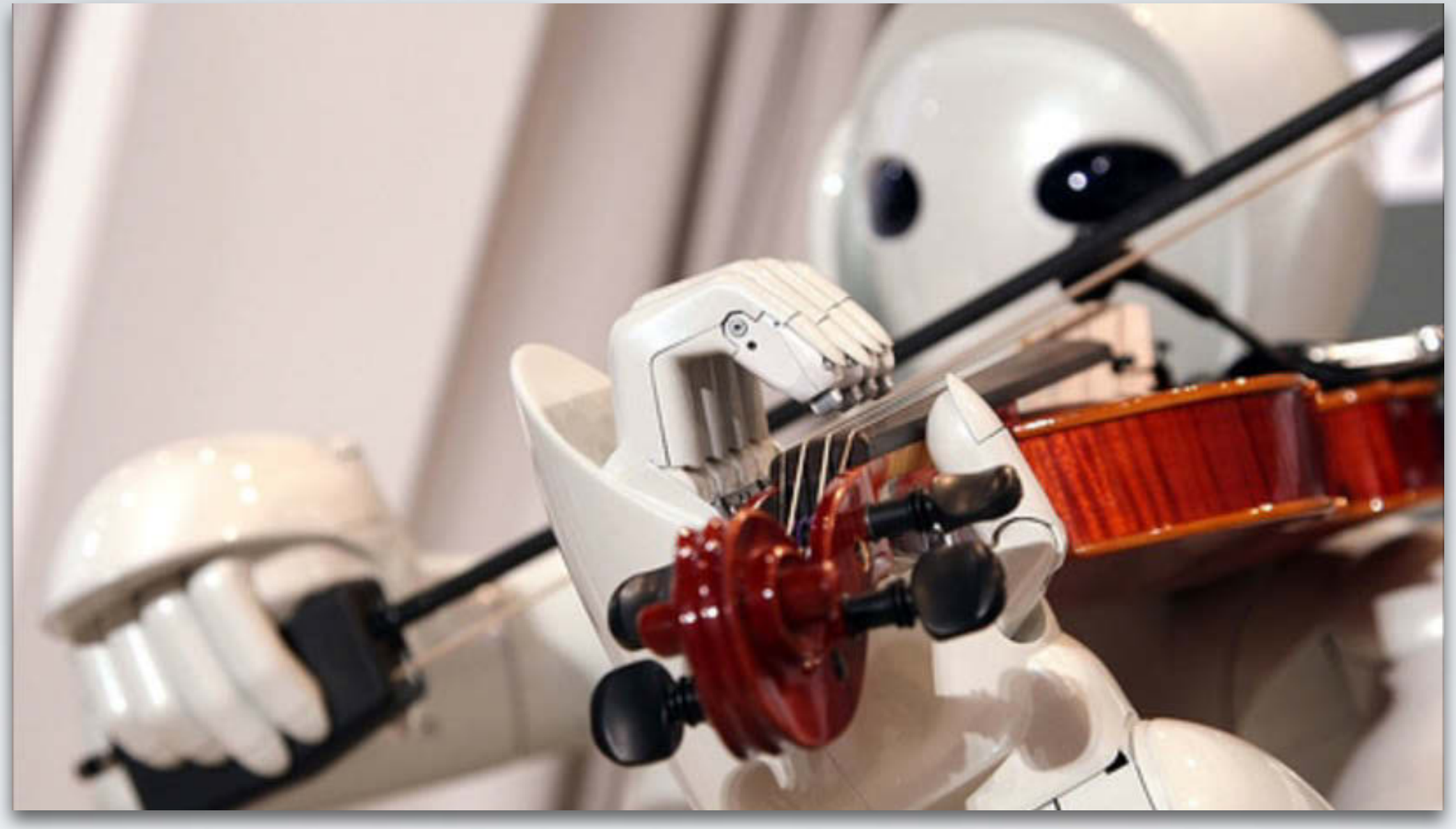
- Release: 2011
- Size(HxWxL): 620-770mm × 280mm × 290mm
- Weight: 3.5kg

ROBINA

- Release: 2007
- Size(HxWxL): 1200mm × 580mm × 580mm
- Weight: 60kg

HUMANOID

- Release: 2007
- Size(HxWxL): 1522mm × 761mm × 497mm
- Weight: 56kg



FUNCTIONS AND FEATURES

of Toyota Partner Robot

HUMAN SUPPORT ROBOT

- Lightweight Body
- Safe Interaction
- Simple Interface

HUMAN SUPPORT ROBOT

- Pick up
- Fetch
- Manual Control

WALK ASSIST ROBOT

- Intelligent Multi-Sensor Control
- Timing Lock Mechanism
- Lightweight Materials

CARE ASSIST ROBOT

- People-friendly Operation System
- Easy and Safe Adjustment Mechanism
- Gentle, Wrap-around Holding Device
- Easy Power Assisted Dolly

ROBINA

- Autonomous motion
- Jointed fingers
- Verbal communication
- Image recognition

HUMANOID

- Playing Trumpet
- Playing Violin

どちらを見ますか？

メニュー

メニュー

拾う

ロボットをコントロールして
カメラで見えるものを
取ってきます。

取ってくる

登録されたものを
登録された場所から
取ってきます。

操縦する

登録されたステップにそって
ロボットのいろいろな動作を
コントロールできます。

DIFFERENCES

- Honda ASIMO
  - human-like design

- Toyota Partner Robot
  - function oriented

DIFFERENCES

- Honda ASIMO
  - simple task at home/in office

- Toyota Partner Robot
  - household and healthcare

FUTURE DEVELOPMENT

- Assisting the elderly
- Perform dangerous tasks

FUTURE DEVELOPMENT

- Provide support in:
  - medical
  - nursing
  - housework

- Care for the elderly

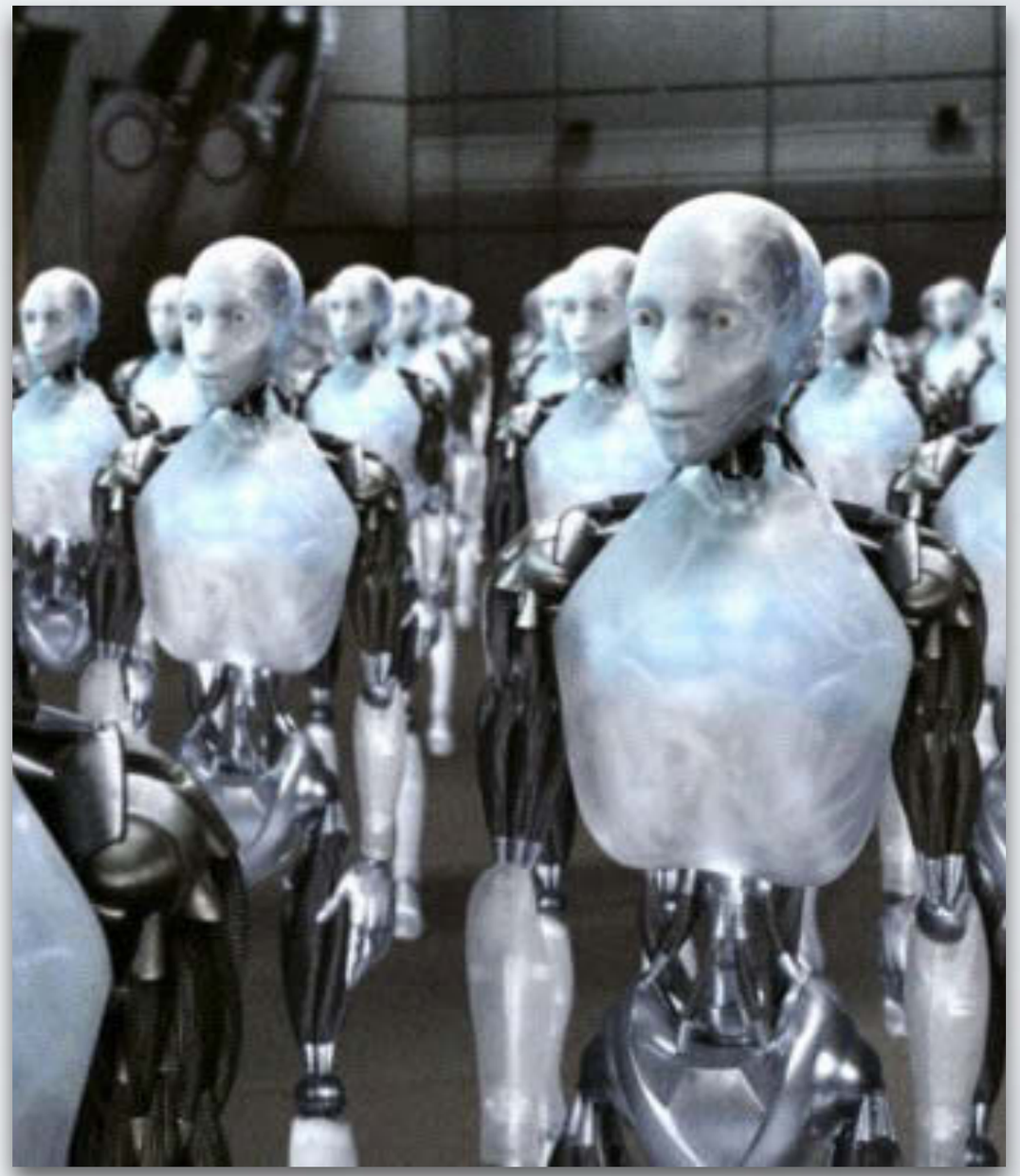
- Planned to be sent to the Moon in 2020

ADVANTAGES

- Higher Productivity
- Higher Precision
- Ignore working environment
- Help taking care of independent home living people

DISADVANTAGES

- Lack of Emotions or Conscience
- Dangerous
- The threat to human dignity
- High cost at implementing stage and maintenance



ALTERNATIVES

other than ASIMO and Partner Robot

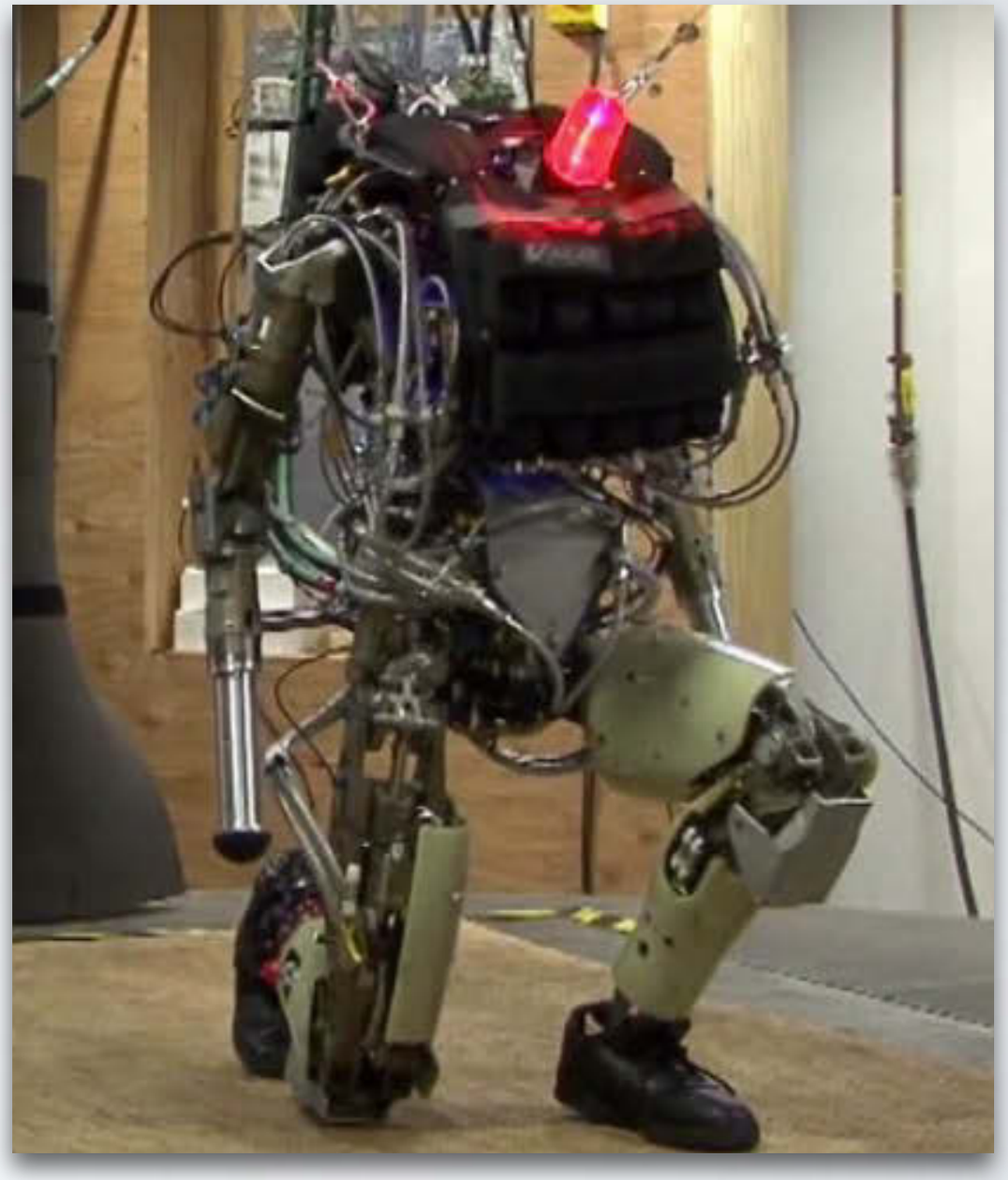
ROBONAUT2

- Developed by GM & NASA
- Automotive and Aerospace industries

PETMAN

- Develop by Boston Dynamics

- Testing chemical protection clothing

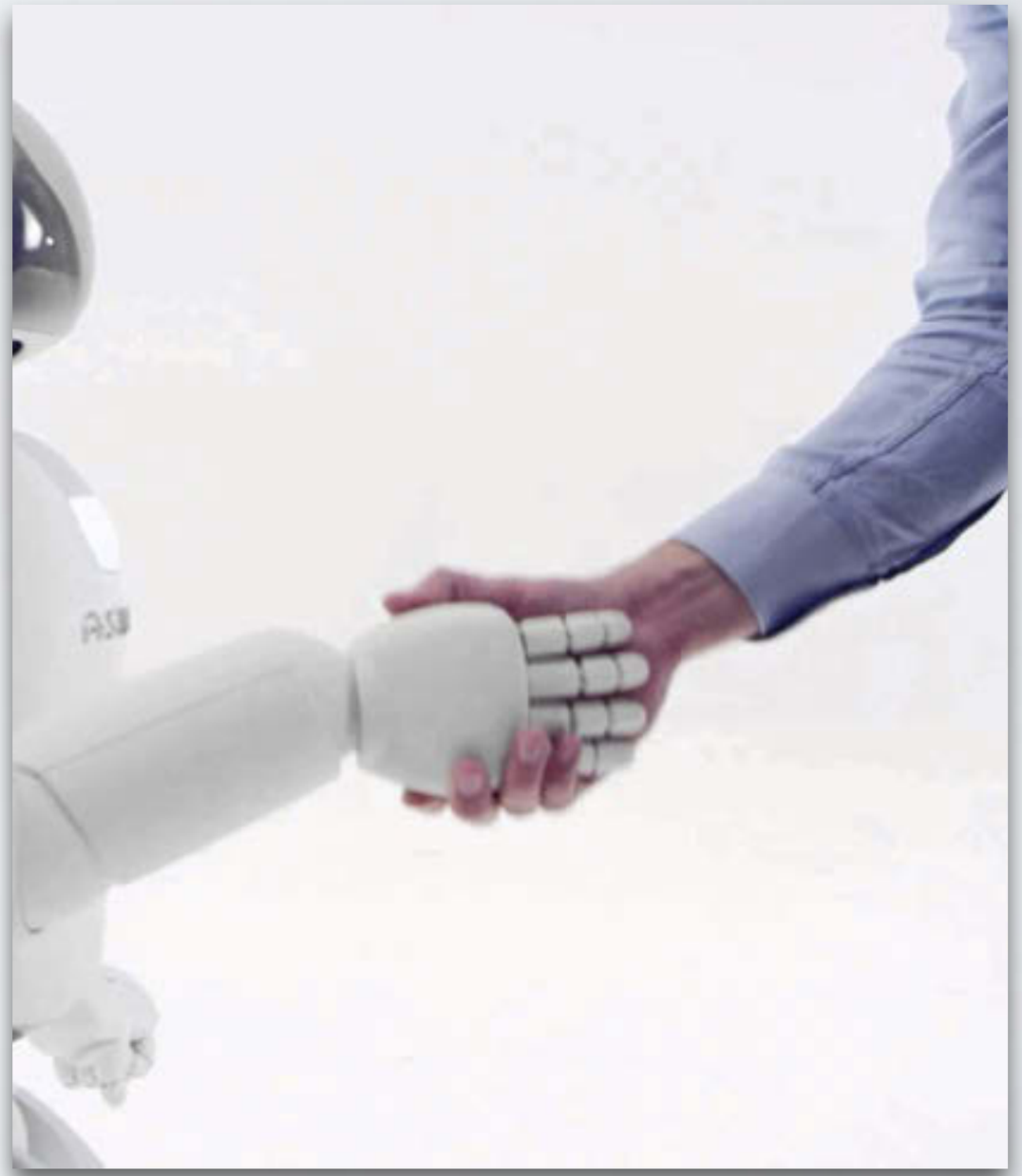


HRP-4C

- Developed by AIST
- Entertainment industry

CONCLUSION

- Bring Convenience
- Enhance Living Standard
- Should not rely too much



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