



# JST's priorities and initiatives in robotics research

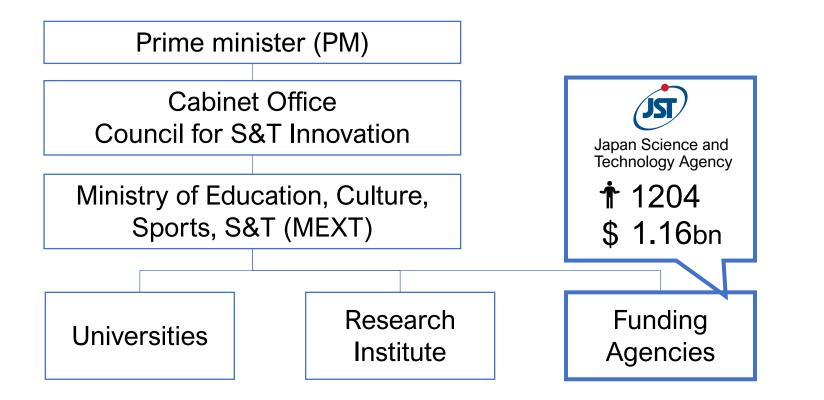
SHIMADA Kazuyoshi, Ph.D Director, Washington, D.C. Office Japan Science and Technology Agency

2022.4.21 @ NSF NRI/FRR Panel



A mission-oriented funding agency, implementing Japan's national Science, Technology and Innovation (STI) policies\*.

\*Science, Technology, and Innovation Basic Plan etc.





Dr. Kazuhito Hashimoto President of JST (since April 1, 2022)



### Science, Technology and Innovation Basic Plan

- Implementation of Society 5.0
- 'Convergence of knowledge' for innovation and human well-being
- R&D investment for 5 years

### **MEXT's Strategic Objectives (AI & Robotics fields)**

[2022] Creation of fundamental technologies to analyze human and society for Society 5.0[2021] System software technology to support safety, security, and trust in the era of Society 5.0[2020] Trusted AI

[2019] Creating information utilization platform by integrating mathematical and information sciences, and development to society

[2019] Fundamental technologies for next-generation IoT (Internet of Things) to create a future smart society

[2018] Creating Technology for Computing Revolution for Society 5.0

[2017] Advanced Interaction Technologies within Networked Intelligent Information Environment



A human-centered society that balances economic advancement with the resolution of social problems by a system that highly integrates cyberspace and physical space.

#### **Economic advancement**

- The demand for energy is increasing
- The demand for foodstuffs is increasing
- Lifespan is becoming longer, and the aging society is advancing
- International competition is becoming increasingly severe
- Concentration of wealth and regional inequality are growing

#### **Resolution of social problems**

- Reduction of GHG emissions
- Increased production and reduced loss of foodstuffs
- Mitigation of costs associated with the aging society
- Promotion of sustainable industrialization
- redistribution of wealth, and correction of regional inequality

Incorporating new technologies such as IoT, robotics, AI, and big data in all industries and social activities, provide goods and services that granularly address manifold latent needs without disparity

to balance economic advancement with the resolution of social problems



### Robotics is one of strategic segments

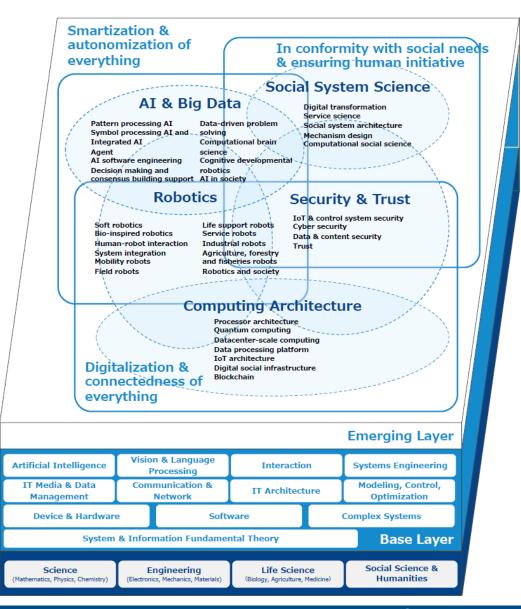
### Vision:

- Advanced integration of the cyber and physical worlds
- Data-driven and knowledge-intensive value creation
- Solving social issues and realizing a humancentric society

### **Technological trends:**

- Digitization & connectedness of everything
- Smartization & automation of everything
- In conformity with social needs & ensuring human initiative

https://www.jst.go.jp/crds/report/CRDS-FY2020-FR-02.html





### JST's Projects (AI & Robotics)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
R: Human IT Ecosystem														
C: Articicial Intelligence (AI)														
C: Symbiotic Interaction														
E: INAMI JIZAI Body														
P: Humans and Interactions														
M: Modeling and Al														
SIP: IoE Society														
P: Computing Frontiers														
C: Computational Foundation														
SI: Smart and Connected Community														
P: Q-Info Processing														
P: Internet of Things (IoT)														
MS: Coevolution of AI and Robotics														
M: Innovative Al														
P: Math-Structure														
C: Mathematical Information Platform														
MS: Overcoming limitations of body, brain, space and time														
C: Trusted AI system														
P: Trusted Al														
C: Society 5.0 System Software														
P: Platform Software														
P: Social Transformation Platform														

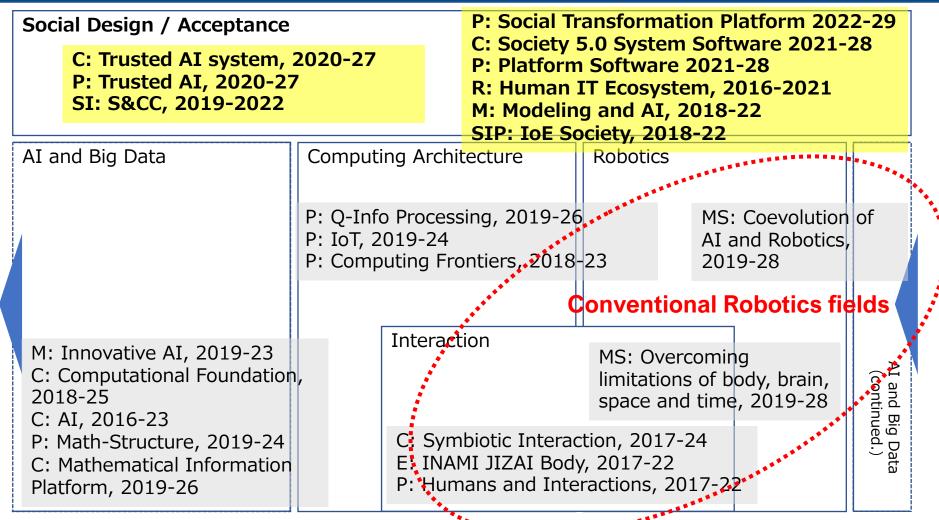
6



Social Design / Acceptance C: Trusted AI system, 2020-27 P: Trusted AI, 2020-27 SI: S&CC, 2019-2022			P: Social Transformation Platform 2022-29 C: Society 5.0 System Software 2021-28 P: Platform Software 2021-28 R: Human IT Ecosystem, 2016-2021								
		M: Modeling and AI, 2018-22 SIP: IoE Society, 2018-22									
AI and Big Data	Computing	g Archit	ecture	Robotics							
	P: IoT, 201	L9-24	ing, 2019-26 ntiers, 2018-		MS: Coevolution AI and Robotics, 2019-28	of					
M: Innovative AI, 2019-23 C: Computational Foundatior 2018-25 C: AI, 2016-23		Interaction			oming of body, brain, time, 2019-28	AI and Big Da (continued.)					
 P: Math-Structure, 2019-24 C: Mathematical Information Platform, 2019-26	E	E: IŃA№	biotic Interact 1I JIZAI Body ans and Inter	, 2017-22		sig Data ued.)					

**[Abbreviation] C:** CREST Basic Research Program (5.5B USD/y\*)/ **P:** PRESTO Basic Research Program (2B USD/y\*)/ **M:** JST-Mirai Program/ **MS:** Moonshot Program (15B USD/y\*)/ **SIP:** Strategic Innovation Program (20B USD/y\*)/ **SI:** SICORP Program (1.5B USD/y\*)/ **R:** Research institute of Science and Technology for Society \*Yearly budgets are rough estimation

# Overview Map (AI & Robotics)



[Abbreviation] C: CREST Basic Research Program (5.5B\*USD/y\*)/ P: PRESTO Basic Research Program (2B USD/y\*)/ M: JST-Mirai Program/ MS: Moonshot Program (15B USD/y\*)/ SIP: Strategic Innovation Program (20B USD/y\*)/ SI: SICORP Program (1.5B USD/y\*)/ R: Research institute of Science and Technology for Society \*Yearly budgets are rough estimation



### Engagement Initiative with NSF

Initiated by **Dr. Panchanathan**, the director of NSF, and **Dr. Hamaguchi**, the (former) president of JST (Since 2021).

### Four thematic pillars of collaboration

- 1. Al and Robotics
- 2. Quantum science
- 3. Resilience
- 4. Millennial generation exchange



### **Objective**

• Strengthen JST- and NSF- funded research and maximize outcomes.

### Workshop(s)

• Exploring new research agendas connecting Artificial Intelligence, Robotics, Humanities and Social science (February 1&7, 2022)



### Thank you for your attention!

### You can find JST-funded researchers for your collaboration at the following website: https://www.jst.go.jp/kisoken/aip/colab/en/

## AIP Network Co-Lab.

- Kazuyoshi Shimada - kshimada@jst.go.jp