Working Group 1

Expanding human potential toward a society in which everyone can pursue their dreams

Chair: Dr. Miwako Doi, Sub-Chair: Dr. Hiroaki Kitano

【The Moonshot [Area],[Vision] for setting MS [Goal] candidate】

[Area]　　・Turning the aging society into the innovative and sustainable society by harnessing diversity through techno-social transformation.

[Vision]　　・Inclusive Society: anyone can pursue their dreams.
　　　　　・Society without health anxiety:
　　　　　　everyone can enjoy life until 100 years old.

[Examples of MS Goal candidate to be used as reference]
　　1) Create and deploy "Cyborg technology" to augment human capability
　　2) Fully ubiquitous and inclusive mobility
　　3) Create and deploy advanced avatars enabling most daily life can be done
　　　　through avatar
　　6) Universal medical access at the global scale
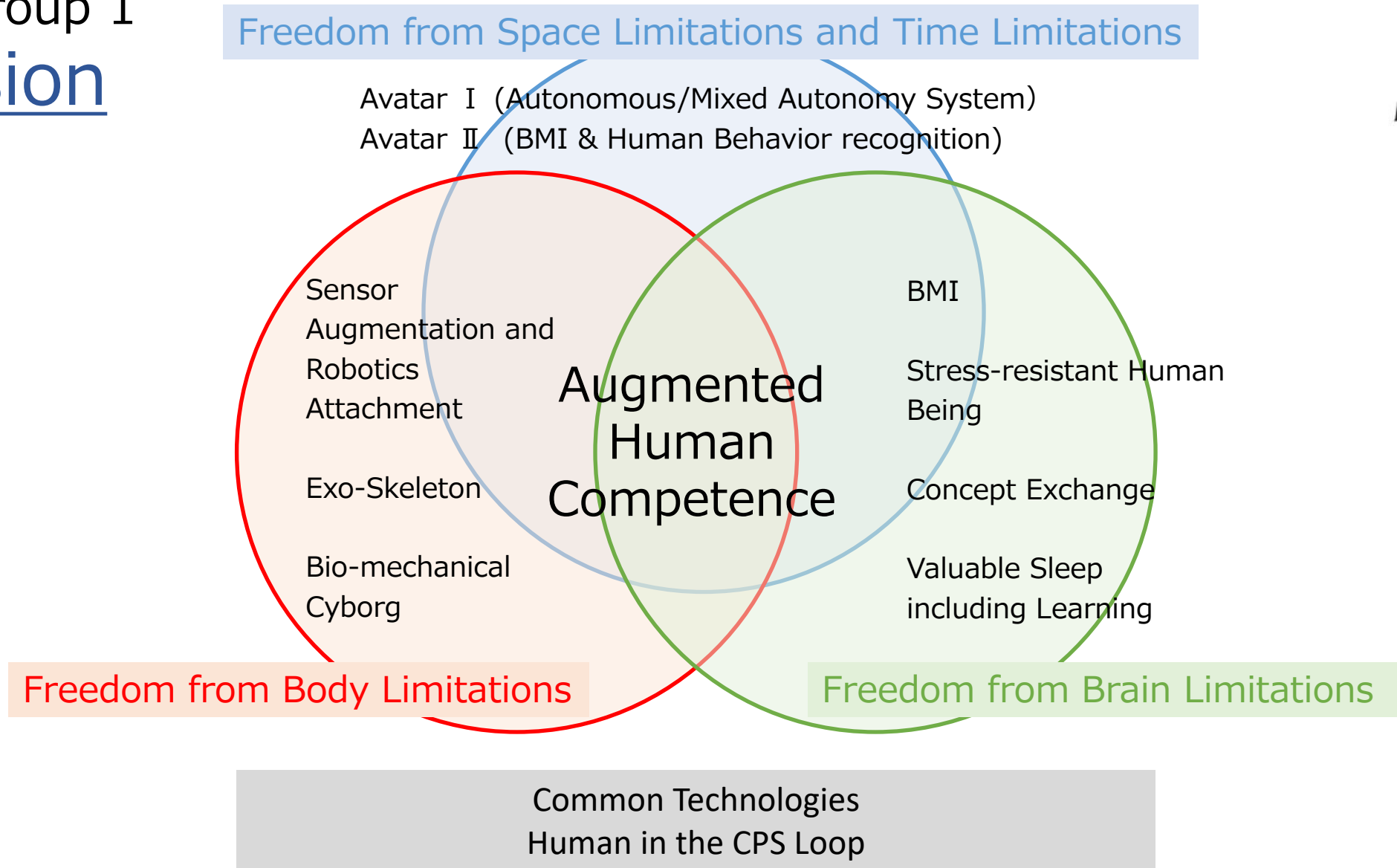
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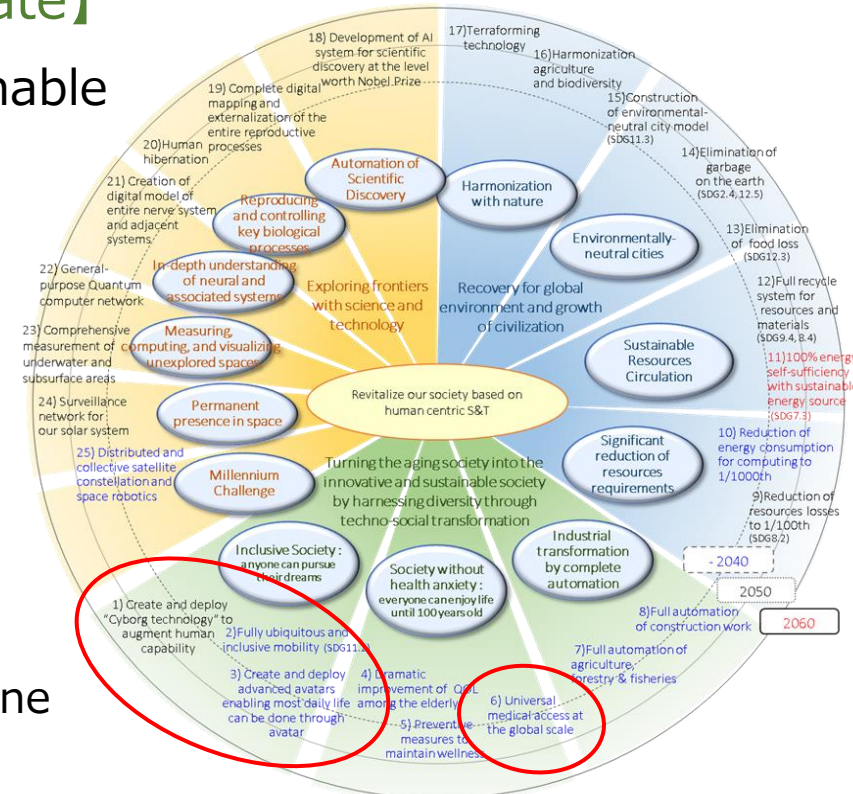
Working Group 1
Discussion

【MS Goal candidate】

・By 2050, realization of a society in which human beings can be free from their limitations of body, brain, space, and time with harmonious empowerment.

Symbiotic Diversity Society 2050

Augmented Creatures (Human, Animal, Plants, etc.) and Artificial Ones with Physical-Cyber Environments

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Freedom from Space Limitations and Time Limitations

Avatar Ⅰ (Autonomous/Mixed Autonomy System)
Avatar Ⅱ (BMI & Human Behavior recognition)

Sensor Augmentation and Robotics Attachment

Exo-Skeleton

Bio-mechanical Cyborg

Augmented Human Competence

BMI

Stress-resistant Human Being

Concept Exchange

Valuable Sleep including Learning

Freedom from Body Limitations

Freedom from Brain Limitations

Common Technologies
Human in the CPS Loop

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MOONSHOT
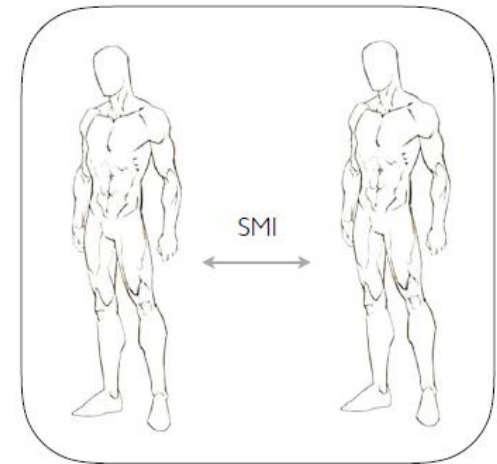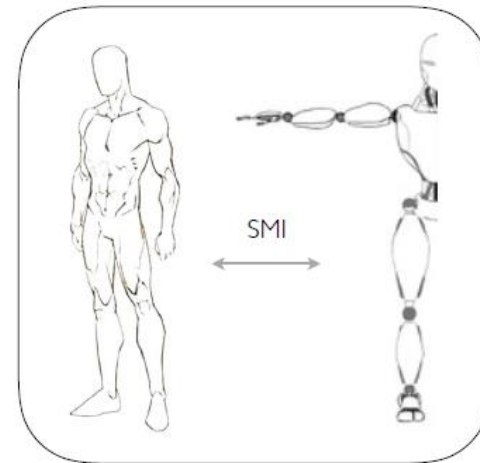RESEARCH & DEVELOPMENT PROGRAM

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Discussion

Freedom from Body Limitations
Prof. Inami, Prof. Prattichizzo, Dr. Kitano

Cybernetic Avatar (C-Avatar)
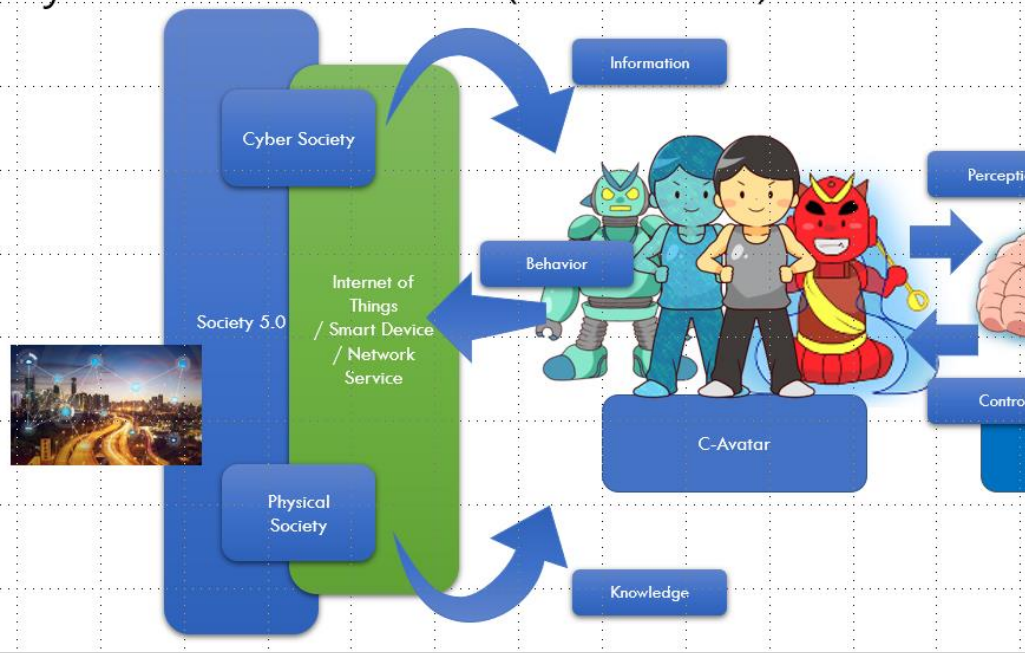
Augmenting Human Body with Robots+ and Humans+

SMI - Sensori-Motor Interface

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Discussion

Freedom from Brain Limitations
Mr. Kanoh, Prof. watanabe, Prof. Hagita

Freedom from the limitation of brain
Expanding of the brain abilitie

Decision
Creation
Motion
Emotion
Speech
Cognition
Perception
Memory
...

Expandi
the brain ab
by drama
technolog ch

C-Avatar Capit
for Diversity a

Brain Analysis   Current
                  Leading e
BM!   technolog
Brain Measurement

2019/12/18   Moonshot In

Development of online MRS neurofeedback

Control the concentration of GABA in a targeted brain region

ATR   orize more
       s global perspective
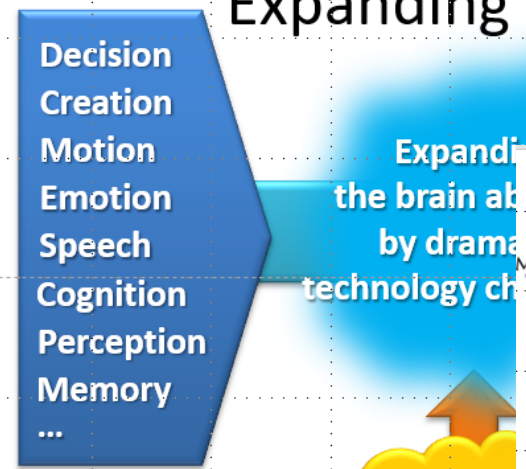
Q1)
"Expanding of the brain abilities" means

BRAIN FUNCTIONS/ABILITIES

Decision
Creation
Motion
Emotion
Speech
Cognition
Perception
**Memory**
...
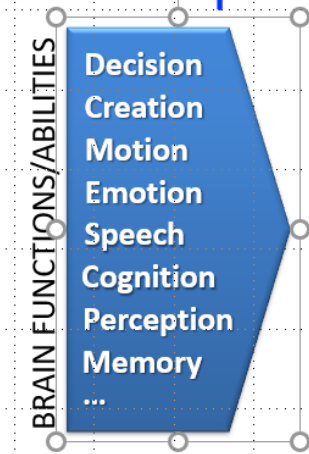
New Brain
Functions?

C-Avatar Capitalism
for Diversity and Inclusion

C-Avatar Life

If only one teleoperator *could* control many C-Avatars,
May human brain *acquire new functions?*

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Freedom from Space Limitations and Time Limitations
Dr. Kitano, Dr. Locke, Prof. Inami
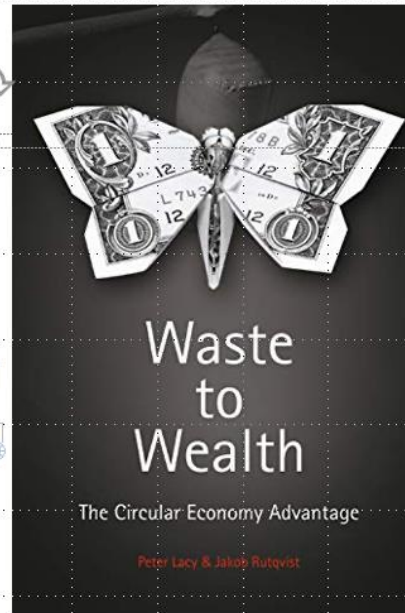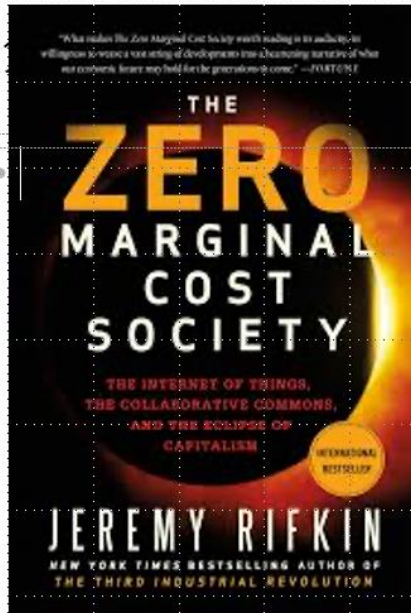
AVATAR APPLICATIONS

Physical robotic avatars can be used across a range of possible real-world scenarios including...

- Avatars can connect humans to humans
- Avatars can connect humans to a specific need or skill
- Avatars can enable us to explore our world

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Discussion

Common Technologies Human in the CPS Loop
Prof. Higashino, Dr. Calvert, Dr. Tokuda

MOONSHOT
RESEARCH & DEVELOPMENT PROGRAM

Research Issues for Fu___

- What do we need for future co___
  technology and cognitive scien___
  robotics and avatar technology___

Innovative Robo___

Intellectual information network
infrastructure connecting a huge
number of AI machines using
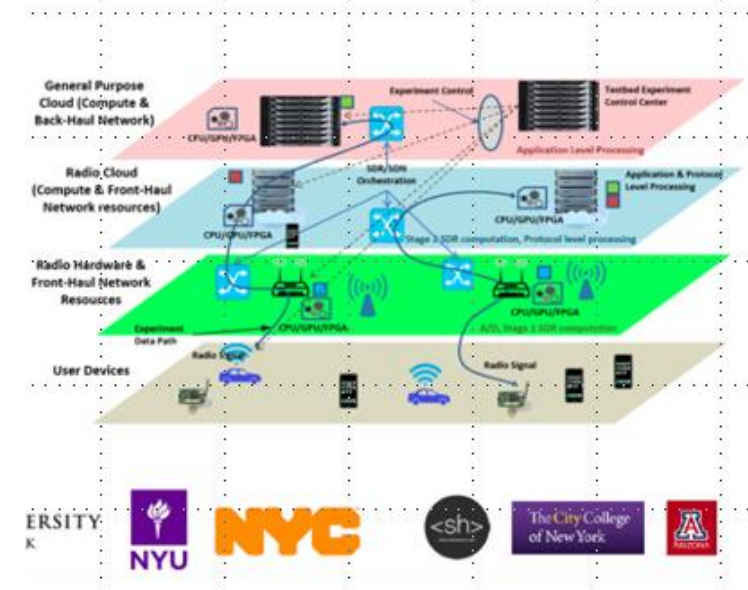high-performance communication
infrastructure

Maintenance-free and zero-energy se___

Technology causing changes
technology for intellectually sh___

2030

COSMOS (Manhattan, NYC)

- Status: Initial availability in 2020

General Purpose
Cloud (Compute &
Back-Haul Network)

Radio Cloud
(Compute & Front-Haul
Network resources)

Radio Hardware &
Front-Haul Network
Resources

User Devices

Experiment Control

Testbed Experiment
Control Center

ERSITY
K   NYU   NYC   <sh>   The City College
of New York

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Working Group 1
Conclusion

【MS Goal candidate】

・By 2050, realization of a society in which human beings can be free from their limitations of body, brain, space, and time with harmonious empowerment.

【Target】

Cybernetic Avatar Capitalism for Diversity and Inclusion
・By 2050, develop technologies and infrastructure to carry out large-scale complex tasks using combinations of large numbers of avatars and robots that are teleoperated by multiple persons.

Cybernetic Avatar Life
・By 2050, anyone willing shall be able to augment their physical, cognitive, and perceptional capabilities to the level of the best experts of selected domains.

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Conclusion

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