

How Sci-Fi Prototyping Expand Roadmap for Cybernetic Avatar

- Hirotaka Osawa

- 1) Assoc. Prof., Keio University
- 2) Visiting Assoc. Prof., University of Tsukuba
- 3) Director, Keio Science Fiction Research and Development Center
- 4) Board of Directors, Science Fiction and Fantasy Writers of Japan



Keio Sci-Fi R&D Center



Research Background

- Human-Agent Interaction
 - Social robots and social intelligence
 - Program Chair of HAI 2016, 2019, 2020
 - General Chair of HAI 2025
 - HAI Steering member
- Imagination
 - Leader of Science Fiction R&D Center
 - Imagination & Social Intelligence AI Group Leader, AIC



Call for Full Papers

The 13th International Conference on Human-Agent Interaction (HAI 2025) aims to be a major interdisciplinary forum for discussing and

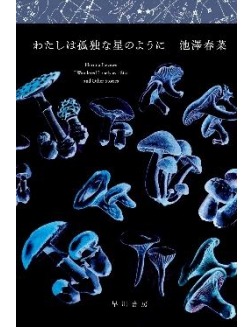
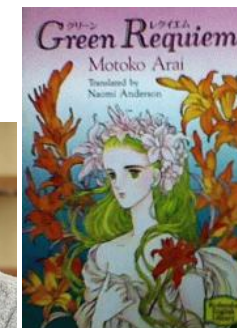
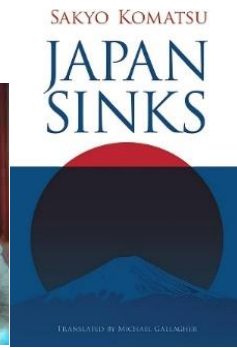


Science Fiction and Fantasy Writer of Japan

日本SF作家クラブ

• 273 members in 2024

1st	1976 - 1977	Shin'ichi Hoshi
2nd	1978 - 1979	Tooru Yano
3rd	1980 - 1983	Sakyo Komatsu
4th	1984 - 1985	Yasutaka Tsutsui
5th	1986 - 1987	Aritsune Toyota
6th	1988 - 1991	Kouji Tanaka
7th	1992 - 1993	Chiaki Kawamata
8th	1994 - 1995	Baku Yumemakura
9th	1996 - 1999	Go Nagai
10th	1999 - 2001	Mariko Ohara
		Mari Kotani
11th	2001 - 2003	Chohei Kambayashi
12th	2003 - 2005	Masaki Yamada
13th	2005 - 2007	Koshu Tani
14th	2007 - 2009	Haruka Takachiho
15th	2009 - 2011	Motoko Arai
16th	2011 - 2013	Hideaki Sena
17th	2013 - 2015	Tsukasa Higashino
18th	2015 - 2018	Taiyo Fujii
19th	2018 - 2020	Jouji Hayashi
20th	2020 - 2022	Haruna Ikezawa
21st	2022 - 2024	Hirtoaka Osawa
22th	2024 - 2026	Masahiko Inoue



Publication and Activity

- As 21th President of Science Fiction and Fantasy Writers of Japan (<https://sfwj.jp>)
 - Statement for Generative AI
 - Books
- Sci-Fi prototyping in Government and company

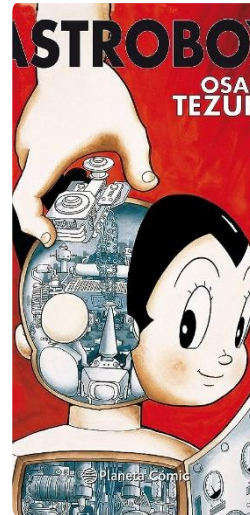


- Ministry of Agriculture, Forestry and Fisheries
- National Institute of Science and Technology Policy

- Hokuto, Yamanashi,
- Omuta, Fukuoka,
- Maebashi, Gunma,
- Hibiya, Tokyo

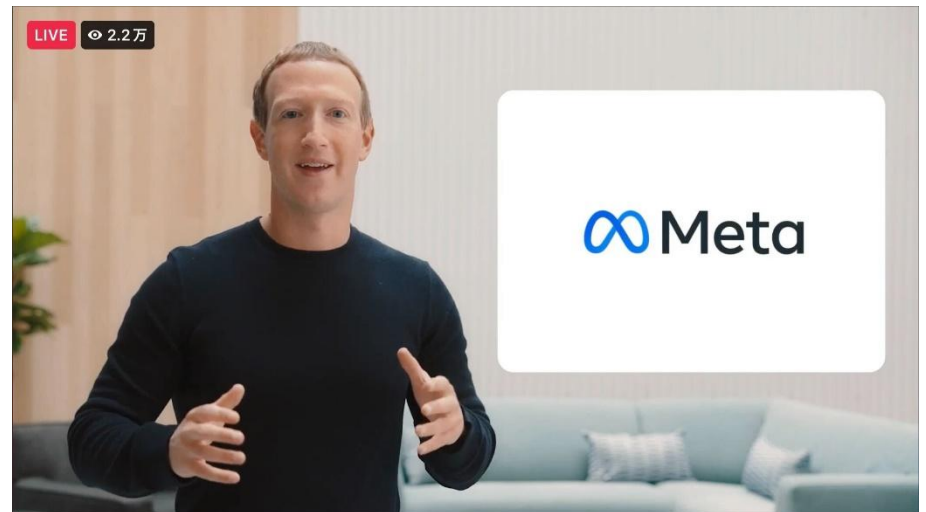
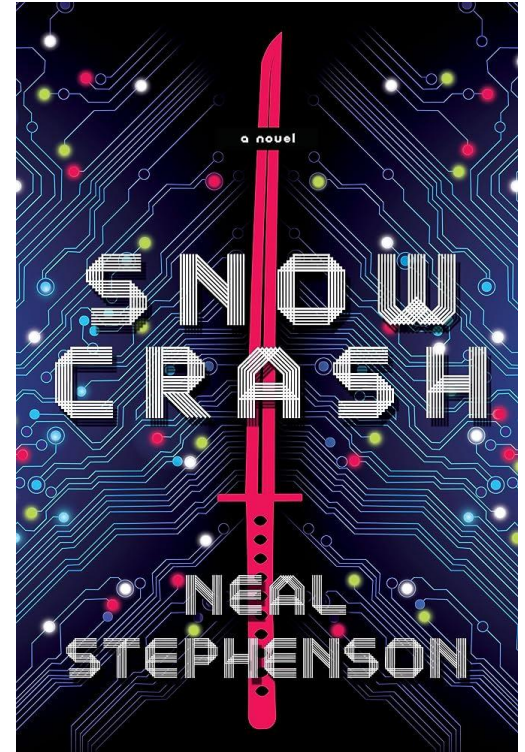


Science Fiction: Imagination, and Innovation



Ideas from Science Fiction

- Space Development
- Robotics
- Cyberspace
- Cyborg
- Avatar
- Metaverse



Science Fiction as innovation source

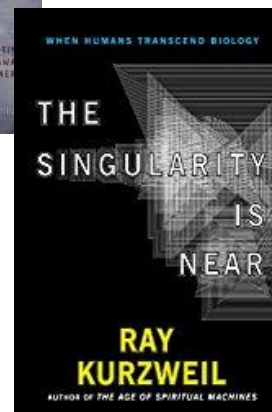
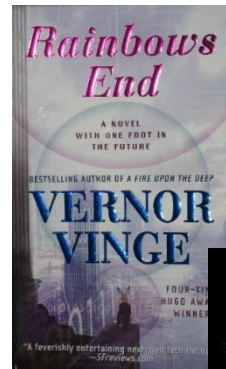
- Science Fiction as visionary



Maker Movement:
Cory Doctorow



Technological Singularity:
Verner Vinge and Ray Kurzweil

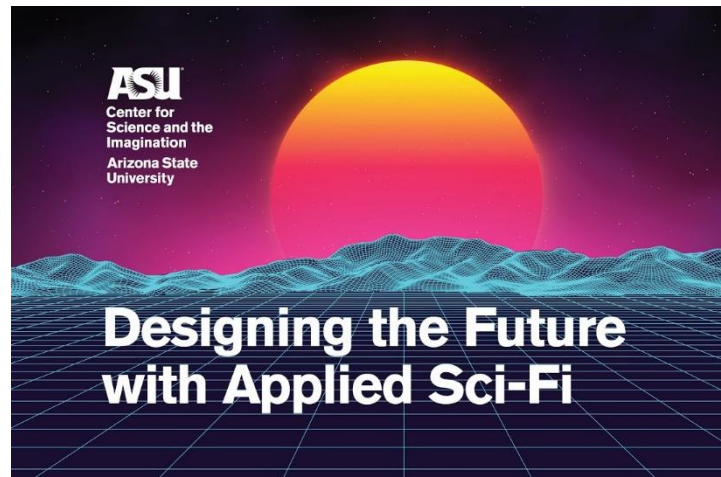
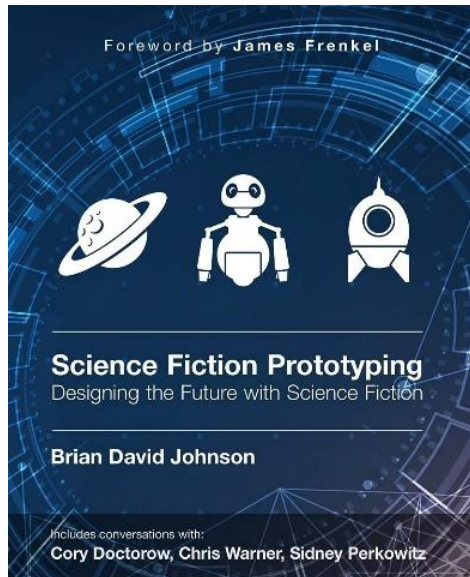


Cyborg Feminism:
Anne McCaffery and Donna Haraway



Sci-Fi Prototyping in US and Europe

- France, Sweden, US

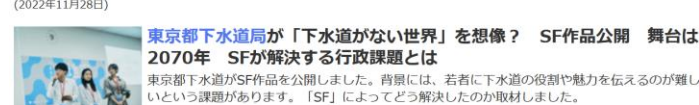
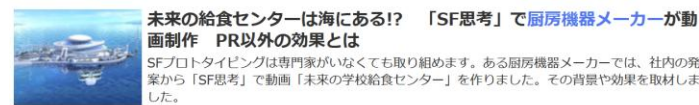
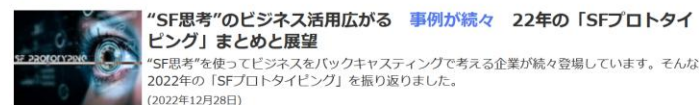
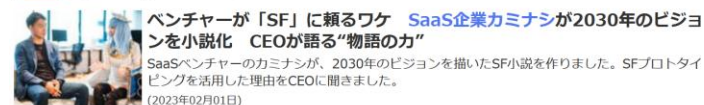
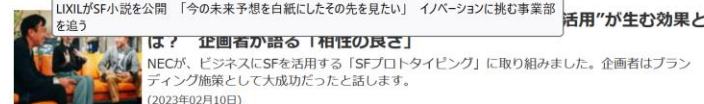
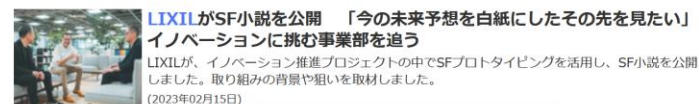
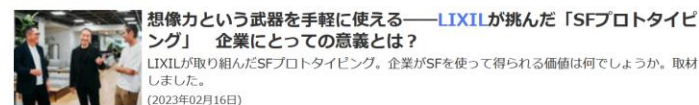
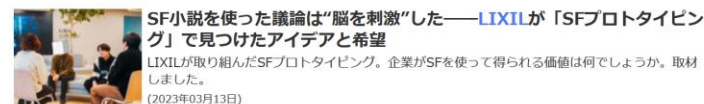
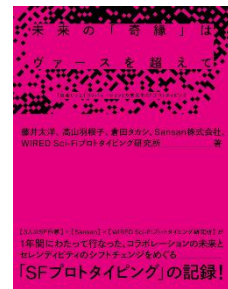
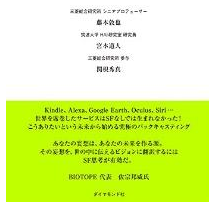


Sci-Fi Prototyping in Japan

- Applying the process of creating SF to vision emergence
 - From 2020~
- MAFF, NISTEP



SF思考
ビジネスと自分の未来を考えるスキル



Example of Sci-Fi Prototyping

山のくらし / 松崎有理 作(PDF:1,821KB)

芸術家は完成した彫刻を都心のギャラリーに運ぼうとするが、その矢先に原因不明のドローン配達障害が発生。自分で作品を運ぶはめになる。やっと電車で乗ると、そこにはずっと交流を断っていた母親が。母は彼女に土産たといって菓子箱を押しつけてくる。そのあと菓子の中身を知り、母がどんなに自分を思いやっていたかに気づく。母親と和解しようと連絡をとる。



街のくらし / 松崎有理 作(PDF:1,933KB)

いつものように自宅で仕事していたアキオは、昼まえになってドローン配達障害を知る。学校から帰ってきた息子たちが空腹をうったえて大騒ぎ。レストランは宅配も持ち帰りも停止しているの、ものすごく久しぶりの息買い出しに出かける。たがどのスーパーも在庫切れでけっきょく手ぶらで帰宅。すると妻がすでに帰っており、数年前に家を出た長女と再会した話をする。アキオはきょうの「食べられない」事件を通じて、娘の神童を理解できた気がした。そんなとき長女から連絡がはいった。



美はまた近くなりけり / 柴田勝家 作(PDF:1,864KB)

都内に暮らす会社員の男性・アサヒは、美容系SNSに投稿を行っている。しかし、自分よりも人気のある「ノゾミ」を名乗るユーザーに複雑な感情を抱いている。アサヒは「フローラオートドライブ」という美容技術でノゾミが使っていることを知る。自身も取り入れるべきか悩むアサヒは、健康で若々しい柳川という老女と知り合う。彼女もまた都内環境の重要性を説く。アサヒも心身ともに大事にすることを願い、フローラオートドライブを使おうと押し立つ。



くらやみマンションS.O.S / 柴田勝家 作(PDF:2,280KB)

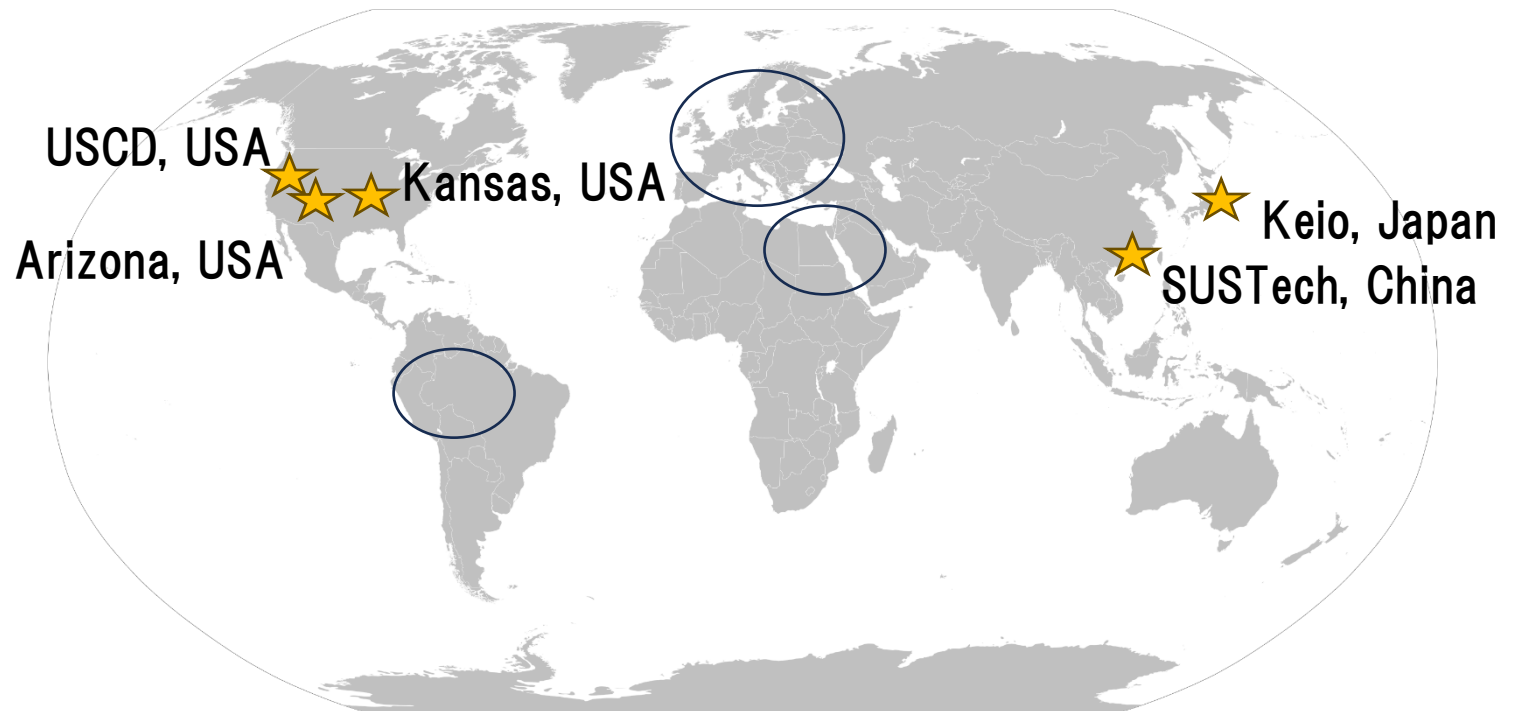
小学生のイザ、みつつ、フクロの三人は社会科の発表で野菜について調べることになった。しかし、誰も野菜がどこから来るのかを知らない。悩む三人は自身の暮らすマンションに「くらやみ園」なるものがあると聞く。三人は「くらやみ園」の話をきいて、米良リツ子という若い男性と出会った。そうしたら、みつつが「くらやみ園」に遊び込められたと言い、イザとフクロが探しに行く。しかし、そこで三人を迎え入れたのは怪しい住人の米良だった。米良の案内によって、三人が自覚したのは狭い室内で栽培される真ミナだった。三人が暮らすマンションは、生ゴミから肥料を作り、マンション内で野菜を作る場所だったのだ。



- MAFF, MRI (2022)
 - Focusing on Food Tech to Solve Food Problems
- Conducted SFP on the theme of "The state of the food table in 2050" and summarized the state of the food table and what needs to be done to realize it.
- The results were compiled into a novel and published on the Web.

We established Keio Sci-Fi R&D Center

- **Imagination Studies (2024/7-2030/3):** JSPS Topic-Setting Program to Advance Cutting-Edge Humanities and Social Sciences Research
- **Toyota fund (2023/2-2026/2) :** Sci-Fi and AI
- **JST Moonshot (2023/4-2025/11):** Sci-Fi and Avatar

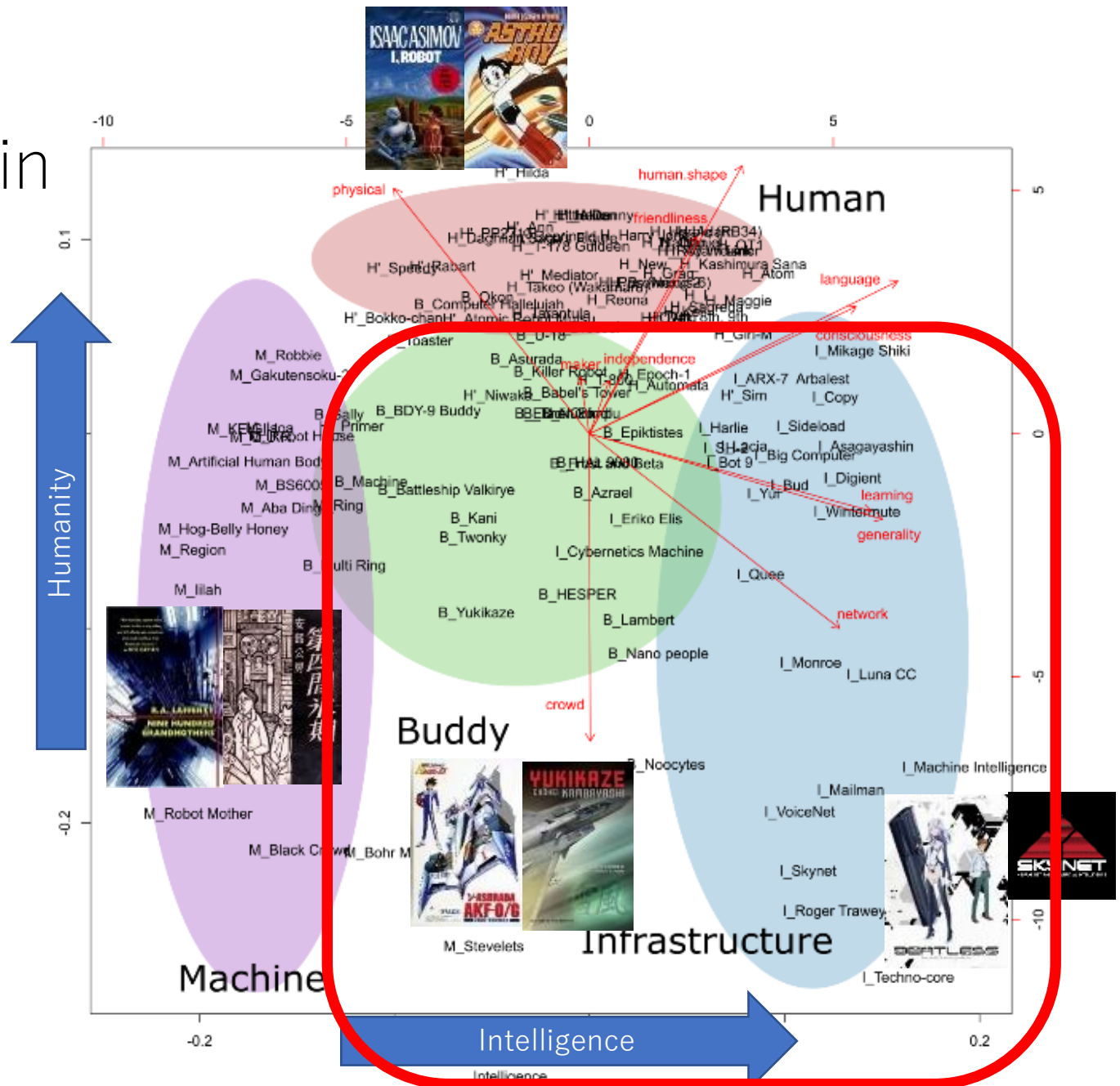




Research by/for Sci-Fi and Sci-Fi Prototyping

AI Agents in Science Fiction

Hirotaka Osawa, Dohjin Miyamoto, Satoshi Hase, Reina Saijo, and Kentaro Fukuchi. 2022. Visions of Artificial Intelligence and Robots in Science Fiction: A Computational Analysis. *International Journal of Social Robotics*.



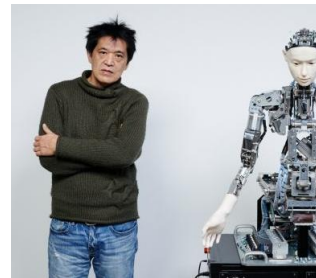
How Sci-Fi Influence AI tech researcher/engineers



Junichi Rekimoto
(The Univ. of Tokyo,
SONY CSL) HCI,
Augmented Reality



Etsuko Harada
(Univ of Tsukuba)
Cognitive Science



Takashi Ikegami
(The Univ. of Tokyo)
Artificial Life



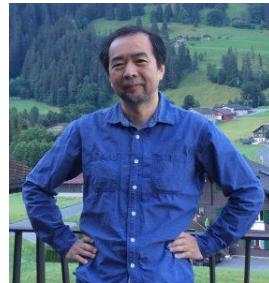
Yoichiro Miyake
(Rikkyo Univ.,
Square Enix)
Videogame



Kanako Yasue
(JAXA) Space
Engineering



Hitoshi Matsubara
(Kyoto Tachibana
Univ.), AI



Shuuji Kajita
(AIST)
Robotics



Tomoko Yonezawa
(Kansai Univ.)
Human-Agent
Interaction



Kouta Minamizawa
(Keio Univ.)
VR and Haptics



Ken Sakamura
(Toyo Univ.)
Operating System



Ai Kawazoe
(Univ. of Tsukuba)
Linguistics,
Writer



Yutaka Matsuo
(The Univ. of Tokyo)
AI

Takahiro Anno
Writer, Politician



Comparison for Sci-Fi Prototyping with Scenario Planning

Does the proposal have a sense of responsibility to people in society?

Does the proposal have elements to provoke people?

Does the proposal feel credible (realistic)?

Is the proposal novel?

Is the proposal fun?

Is the proposal intuitive and easy to understand?

Is the need for the proposal deep?

Is the need for the proposal broad?

Do you want to give a "Go" vote for continuation of the proposal?

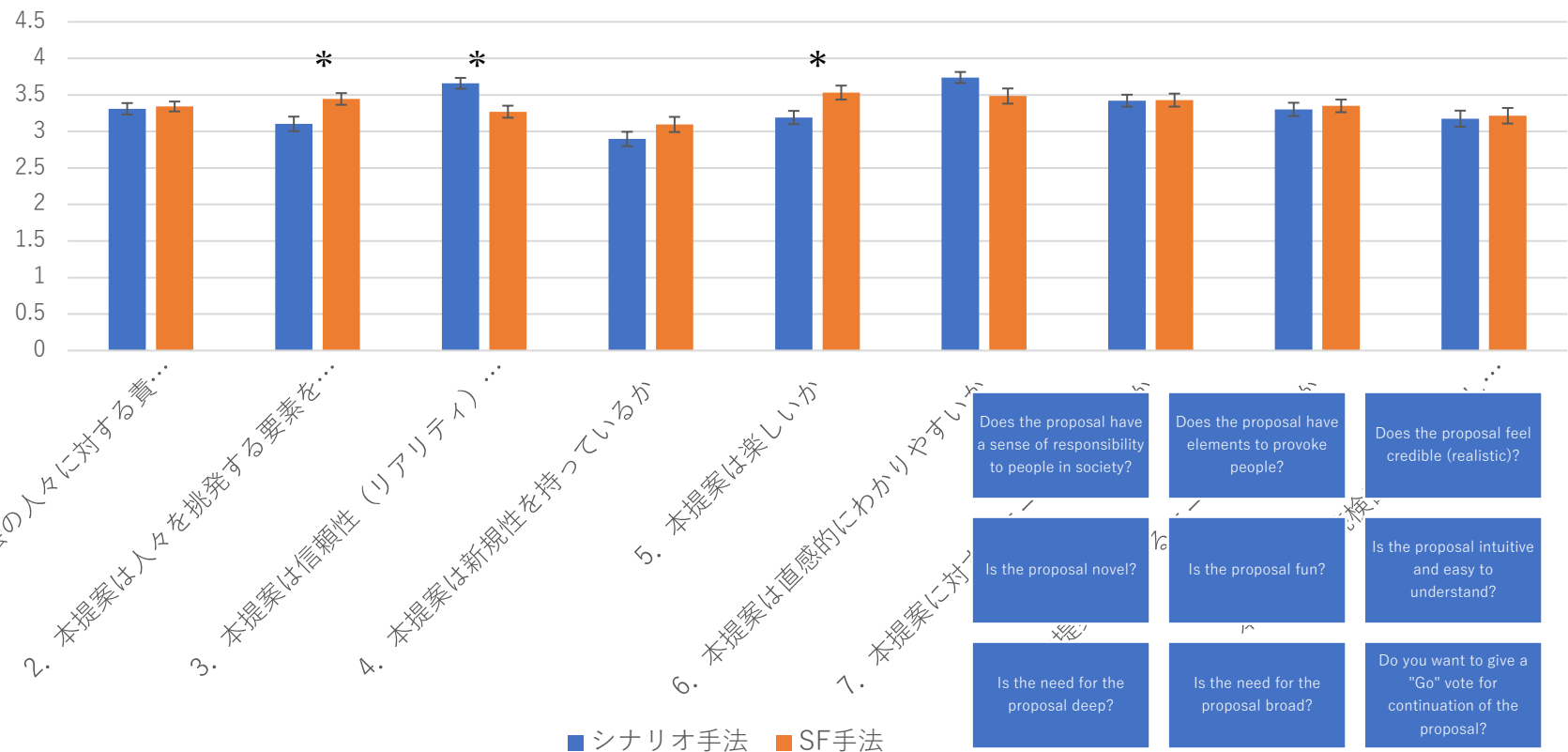


MRI
株式会社三菱総合研究所

1. H. Osawa, D. Miyamoto, A. Fujimoto, and H. Sekine. 2021. Evaluation of future vision creation using science fiction prototyping. In Interaction, 719-721.

Comparison for Sci-Fi Prototyping with Scenario Planning

- The vision obtained by the science fiction method is more provocative and entertaining, but on the other hand, it is less realistic



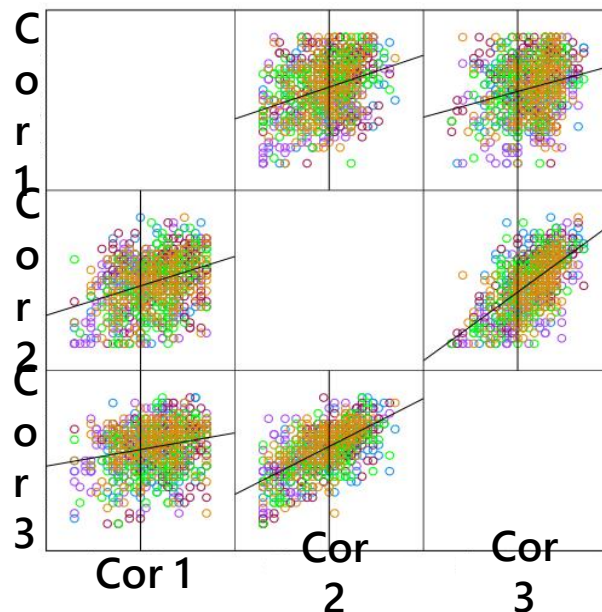
Reality ≠ Good Vision

- Credibility (reality) of an idea is not necessarily a factor that keeps a proposal alive
 - Provocativeness, fun, novelty, and intuitiveness of the proposal are more important

	1. 本提案は社会の人々に対する責任感を持っているか	2. 本提案は人々を挑発する要素を持っているか	3. 本提案は信頼性（リアリティ）があると感じるか	4. 本提案は新規性を持っているか	5. 本提案は楽しいか	6. 本提案は直感的にわかりやすいか	7. 本提案に対するニーズは深そうか	8. 本提案に対するニーズは広そうか	9. 本提案の継続検討にGoを出したいか
1. 本提案は社会の人々に対する責任感を持っているか	1								
2. 本提案は人々を挑発する要素を持っているか	0.316234	1							
3. 本提案は信頼性（リアリティ）があると感じるか	0.165307	0.065384	1						
4. 本提案は新規性を持っているか	0.182735	0.358855	-0.07894	1					
5. 本提案は楽しいか	0.179469	0.49875	0.189434	0.480175	1				
6. 本提案は直感的にわかりやすいか	0.125377	0.026704	0.398133	0.018049	0.360424	1			
7. 本提案に対するニーズは深そうか	0.328386	0.202228	0.262084	0.216515	0.349835	0.393262	1		
8. 本提案に対するニーズは広そうか	0.24862	0.127286	0.242278	0.119228	0.249851	0.337146	0.450082	1	
9. 本提案の継続検討にGoを出したいか	0.399376	0.444533	0.270532	0.544379	0.661422	0.406718	0.555607	0.511742	1

Narrative evaluation of SF Prototyping works

- Plot by Sci-Fi Prototyping is more Speculative and Inspiring than Usual Sci-Fi Story



作品
作品3
作品4
作品5

Cor	1	2	3
1	1	0.399	0.251
2	0.399	1	0.693
3	0.251	0.693	1

SF思考
ビジネスと自分の未来を考えるスキル

三菱総合研究所 シニアプロデューサー

藤本敦也

筑波大学 HAI 研究室 研究員

宮本道人

三菱総合研究所 参事

関根孝真

Kindle, Alexa, Google Earth, Oculus, Siri...
世界を席巻したサービスはSFなしでは生まれなかった!
こうありたいという未来から始める究極のバックキャスト

あなたの妄想は、あなたの未来を作る源。
その妄想を、世の中に伝えるビジョンに翻訳するには
SF思考が有効だ。

BIOTOPE 代表 佐宗邦威氏

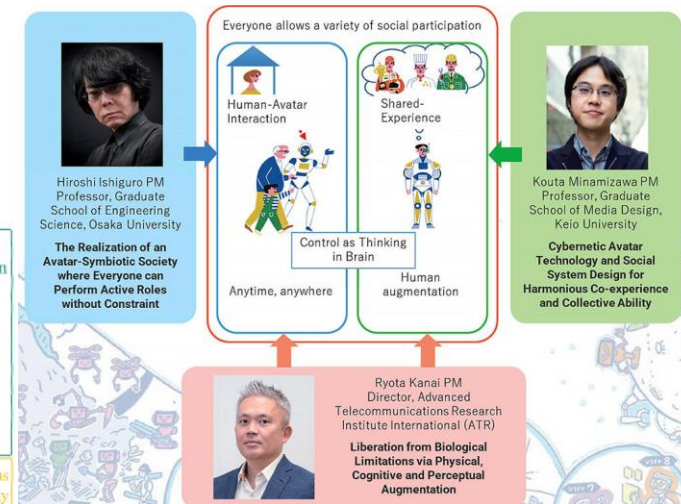
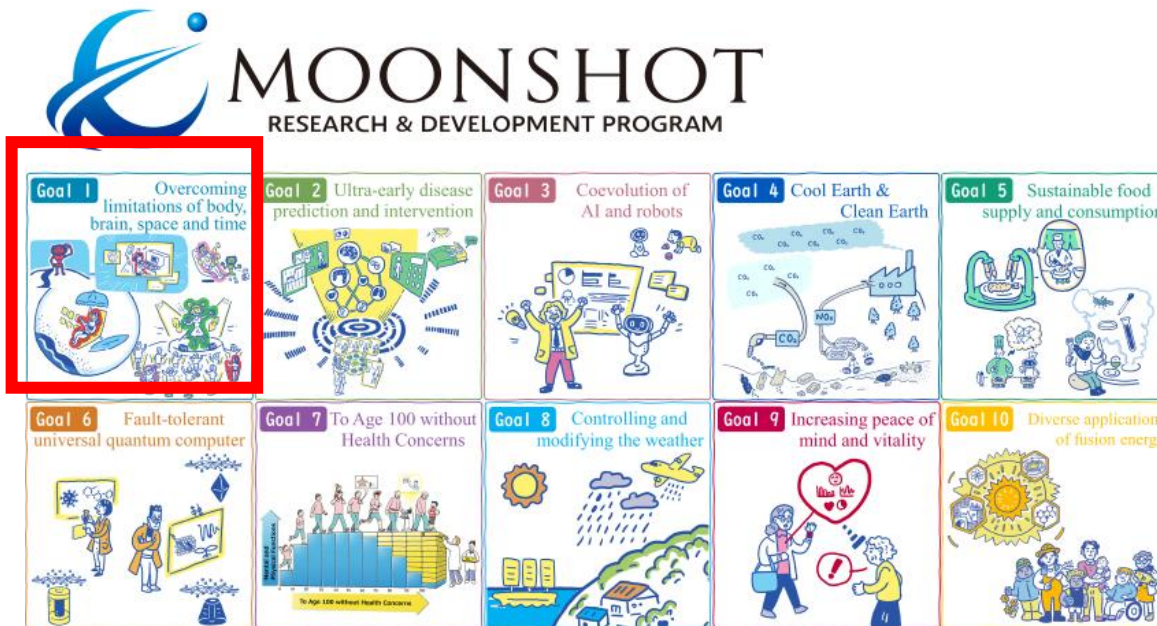
ダイヤモンド社

Kiyokawa, Sachiko, Dohjin Miyamoto, Miwa Nishinaka, Yuuki Namba, Tomoya Minegishi, Ryu Miyata, and Hirotaka Osawa. 2022. "Science Fiction Prototyping Method Improves Readers' Narrative Experiences." In *International Conference on Knowledge, Information and Creativity Support Systems*, accepted.

Namba, Yuuki, Miwa Nishinaka, Sachiko Kiyokawa, Dohjin Miyamoto, Tomoya Minegishi, Ryu Miyata, and Hirotaka Osawa. 2022. "The Narrative Experience Scale of Science Fiction: Comprehension, Immersion, and Speculation." In *International Conference on Knowledge, Information and Creativity Support Systems*, accepted.

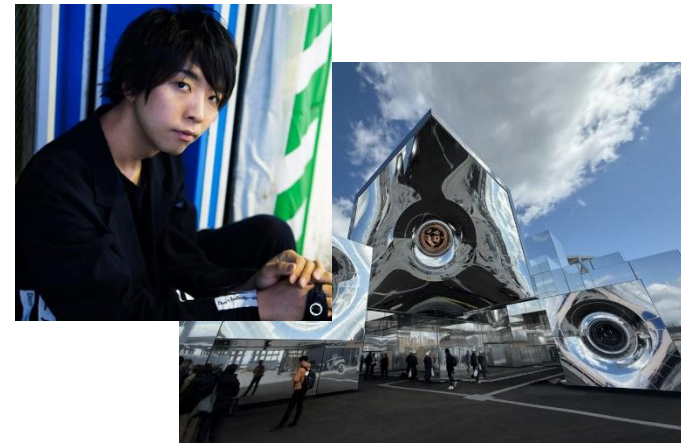
Keio Sci-Fi Center and JST Moonshot Project

- Realization of a society in which human beings can be free from limitations of body, brain, space, and time by 2050.
 - We call it as **Cybernetic Avatar**
- **Personality fusion approach**
 - Expert or AI supports movement of people



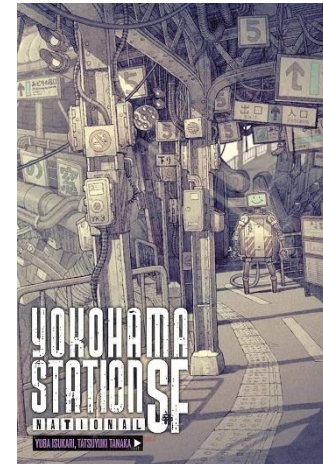
Moonshot Visionary Committee (2019)

- **Makiko Eda**, Representative of the World Economic Forum in Japan
- **Yoichi Ochiai**, Media Artist
- **Marisa Yumi Ozaki, Artist(Sputniko!)**
Associate Professor, University of Tokyo
- **Hiroaki Kitano**, President and CEO, Sony Computer Science Laboratories, Inc.
- **Kobayashi Yoshimitsu**, Representative Director, Keizai Doyukai, Chairman of the Board, Mitsubishi Chemical Holdings Corporation
- **Nishiguchi Naohiro**, Executive Director, Japan Innovation Network, Executive Director
- **Taiyo Fujii**, Science Fiction Writer



Next goal for Moonshot Project

- ... we need next vision!



Haruka
Mugihara



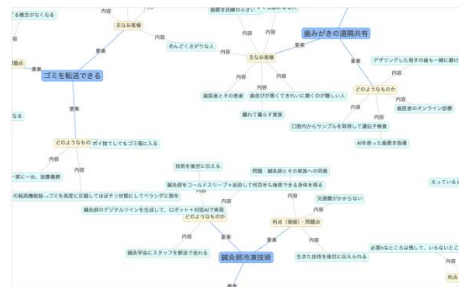
Yuba Isukari



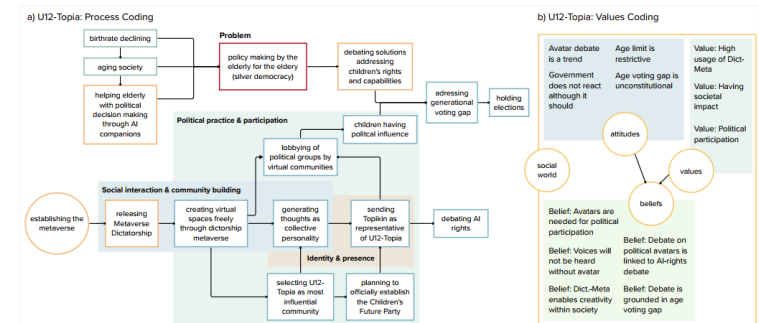
Akari Akane

Sci-Fi Prototyping in Moonshot

- Analysis of the workshop itself
 - The number of ideas decreases when adults facilitate.
 - It is easier to come up with ideas when talking with other minors.
 - The number of ideas increases when the facilitator has experience.
 - The number of ideas decreases when ideas are graphed (visualized).



- Content analysis
 - U12Topia
 - A metaverse for children aged 12 and under only: dealing with an aging society
 - Avatar anonymity helps to ensure equal political participation
- Virtual family
 - Children are created by combining the genes of each individual. Families can be formed regardless of generation



CA and Future Fashion: Clothes you don't have to take off – the value of anonymity

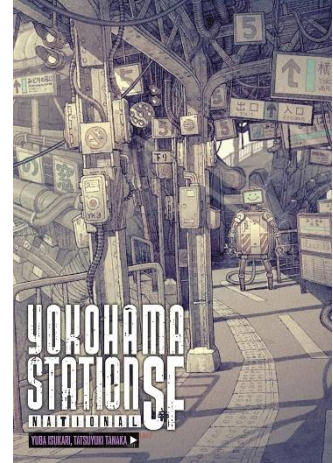
- **Anti-fashion: value that doesn't require choice**
 - In the future of avatar society, the ability to take on any form is often portrayed positively, but is that really the case?
- 2030: Commercial release of 'wearable clothing'
- 2037: Dynamic Fashion Compliance Act + widespread adoption of 'gray recipes'
- 2042 Gray Appraiser National Licensing
- 2050 Core Suit Standard Attire: Collective Integration as Evaluation Criteria



Haruka
Mugihara

CA and Future House: Communication-Enhancing House

- Home as avatar
 - The new value of isolation
 - Homes are essentially barriers separating the outside world from the inside world, but in this society, they can also function as filters
- 2028 Floor plan app-based modular housing
- 2035 TRPG homes with “mode declaration” filters
- 2040 Silence bubbles: Homes control communication bandwidth
- 2050: Isolation performance index determines real estate value



Yuba Isukari

CA and Food: Food you can't choose – Indulgence through lack of choice

- Food for experience, not survival
 - Cybernetic Avatars expand the perception of food
 - The value of encountering new things
- 2031 Remote taste network + blind meals
- 2037 “Food roulette” city ordinance / involuntary rate ranking
- 2043 Random number fairness audit law
- 2050 Fully Random Meal Serving Restaurant = Luxury for the Affluent



Akari Akane

Roadmap (2025–2050)

- Choice fatigue → Involuntary/non-individuality/blocking becomes a new value
- 2030s: Individual differences narrow due to automation and standardization
- 2040s: Appraisal/auditing ensures quality
- 2050: Random food, gray clothing, and filtered housing become the tastes of the upper class



Consideration: What is the value of using science fiction in research goal design?

- Sci-fi as Speculative Fiction
- Methods that work well with backcasting
 - Assuming a distant future makes it easier to conceive a vision of the future
- It is easier to assume changes in values
 - Normal future projections have difficulty assuming changing values
- Resistant to social pressure
 - Fiction can be used as an umbrella to say what you want to say
- Addressing the shortcomings in the current research and development system's goal-setting design
 - The issue of prioritizing the happiness of “current people” in goal-setting, despite the need to consider happiness in future society (by 2050)
- By considering the values of future people as possibilities, we can question current values and connect them to the future in a constructive manner
 - In particular, this approach can identify values in minorities
 - Of course, this is not the final form, but it is effective for identifying possibilities

