

Draft AI R&D GUIDELINES for International Discussions

28 July 2017

The Conference toward AI Network Society

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Draft AI R&D GUIDELINES

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Preface

Research and development (R&D) and utilization of artificial intelligence (AI) are expected to progress dramatically in years to come. Under these circumstances, at the G7 Information and Communication Ministers Meeting in April 2016, Japan as the host nation introduced principles of AI development, over which the relevant ministers then held discussions. As a result, the G7 countries agreed that they will continue to lead the discussions of "AI R&D Principles" and "AI R&D Guidelines," which explains the principles, with the cooperation of international organizations such as OECD.

With proactive development and utilization of AI, Japan can solve various problems arising from challenges that it is confronted with (such as a declining birthrate and aging population). Moreover, with the findings obtained, Japan can make significant contributions to the international community by sharing matters that are expected to be taken into account in the AI development.

This draft is prepared as a basis for international discussions at G7 and OECD regarding matters expected to be considered in R&D activities for promoting the benefits and reducing the risks of AI. Considering that AI-related technologies are in the middle of development, it is NOT appropriate to treat international AI R&D Principles and AI R&D Guidelines, which explains the principles, as aimed for introduction of regulations. Rather, this draft is drawn up as a proposal of guidelines that will be internationally shared as non-regulatory and non-binding soft law. It is expected that the deliberations on such guidelines will:

- accelerate the participation of multistakeholders involved in R&D and utilization of AI (such as developers, service providers, users including civil society, governments, and international organizations) at both national and international levels, in the discussions towards establishing "AI R&D Guidelines" and "AI Utilization Guidelines"; and
- promote the international sharing of best practices in the R&D and utilization of AI, which will help gain the trust of users and the society in AI and facilitate the R&D and utilization of AI.

Draft AI R&D GUIDELINES¹

1. Purpose

R&D and utilization of AI are expected to progress rapidly in years to come. In the process of the evolution of AI networking (that is a formation of networks in which AI systems are connected, over the Internet or other information-and-communication networks, to each other or to other types of systems (which is called “AI networks” hereafter)), enormous benefits are expected for humans as well as the society and the economy in such manners as making significant contributions to solving various problems that individuals, local communities, countries, and the international community² are confronted with. The R&D and utilization of AI should be accelerated in such a direction.

As part of this, from the viewpoint of promoting the benefits from AI systems to the society and the economy as well as mitigating the risks such as lack of transparency and loss of control, it becomes necessary to address relevant social, economic, ethical, and legal issues. In particular, services utilizing AI systems, like other information-and-communication ones, will be provided beyond national borders via networks; therefore, it is essential to share guidelines, which serve as non-regulatory and non-binding soft law, and their best practices among stakeholders (such as developers, service providers, users including civil society, governments, and international organizations) through open discussions to foster an international consensus, so that the benefits from AI systems will be increased and risks with them be controlled.

In view of such awareness, the Guidelines aim at protecting the interests of users and deterring the spread of risks, thus achieving a human-centered “Wisdom Network Society”³ by way of increasing the benefits and mitigating the risks of AI

¹ This draft has been prepared to be used for international discussions on the establishment of an internationally shared AI R&D Guidelines.

² For details on challenges faced by the international community, refer to the United Nations “Sustainable Development Goals” (SDGs) (http://www.un.org/ga/search/view_doc.asp?symbol=A/70/L.1)

³ A *Wisdom Network Society* is a society where, as a result of the progress of AI networking, humans live in harmony with AI networks, and data/information/knowledge are freely and

systems through the sound progress of AI networks.

To achieve the above-mentioned purpose, the Guidelines compile AI R&D Principles, which will be expected to be considered in AI-system development in the future, along with comments on the Guidelines.

While the R&D of AI systems covers various fields of the utilization, the benefits and risks of the AI systems might differ from field to field. The Guidelines set out matters common to those fields of AI utilization or matters expected to be considered with regard to the collaborations between the fields. On the other hand, for matters expected to be considered according to the circumstances of each field, it is hoped that discussions on guidelines for each field, including whether or not such guidelines should be established, will be held by concerned stakeholders including relevant international organizations in the fields, separately from the Guidelines.

Moreover, AI systems' outputs or programs might continuously change as a result of learning or other methods in the process of the utilization; therefore, while there are matters that the developers are expected to mind, there are other matters that users are expected to mind, too. For this reason, international discussions as to whether to formulate AI utilization guidelines are expected, in addition to the Guideline.

2. Basic Philosophies

Recognizing its purpose, the Guidelines shall be based upon five basic philosophies as follows:

1. To achieve **a human-centered society** where all human beings across the board enjoy the benefits from their life in harmony with AI networks, while human dignity and individual autonomy are respected.

safely created, distributed, and linked to form a *wisdom network*, encouraging collaborations beyond space among people, things, and events in various fields and consequently enabling creative and vibrant developments.

2. To **share the Guidelines**, as non-binding soft law, **and their best practices internationally among stakeholders**, as, with the rapid development of the R&D and utilization of AI, networked AI systems are expected to have broad and significant impacts on human beings and society beyond national borders.
3. **To ensure an appropriate balance between the benefits and risks** of AI networks, so as to: (a) promote the benefits from AI networks through innovative and open R&D activities and fair competition; and (b) mitigate the risk that AI systems might infringe rights or interests, while fully respecting the value of the democratic society such as academic freedom and freedom of expression.
4. To make sure that AI R&D activities based on specific technologies or techniques are not hindered in light of **ensuring technological neutrality**, and **to be mindful that developers are not imposed of excessive burden**, as the rapid progress of AI-related technologies is anticipated to continue. And
5. **To constantly review the Guidelines and flexibly revise them as necessary** through international discussions, considering the extent of the progress of AI networking, because AI-related technologies and AI utilization are expected to continue to advance dramatically. Also, to strive for broad and flexible discussions including the involvement of related stakeholders, when reviewing the Guidelines.

3. Definition of Terms and Scope

3-1 Definition of Terms

In view of the basic philosophies stated in Section 2, the terms related to “AI” used in the Guidelines are defined as follows:

- "AI" refers to a concept that collectively refers to AI software and AI systems.⁴

⁴ This definition of AI is assumed in the Guidelines to apply mainly to Narrow AI which has already been put into practical application. In anticipation of rapid technological progress related to AI such as autonomous AI and artificial general intelligence (AGI), however, it will

- "AI software" refers to software that has functions to change its own outputs or programs in the process of the utilization, by learning data, information, or knowledge; or by other methods⁵. For example, machine learning software is classified into this category.
- "AI systems" refers to systems that incorporate AI software as a component. For instance, robots and cloud systems that implement AI software are classified into this category.

"Developers" and "users" of AI systems are defined as follows, although it should be noted that they are relative concepts in that who are developers or users depends on the situation:

- "Developers" refers to those who conduct the R&D of AI systems (which includes R&D using AI systems), including those providing to others AI-network services using AI systems that they have developed on their own.
- "Users" refers to those who use AI systems, including end users as well as providers who provide third parties with AI-network services developed by others.

3-2 Scope

The Guidelines cover **AI systems** that can be networked (i.e. connected to networks), since they can be used across national borders via networks, thereby widely bringing about benefits and risks to humans and society.

The Guidelines cover broadly all **developers** as defined in Section 3-1, given that the Guidelines serve as non-binding soft law.

also be able to cover various types of AI to be developed in the future if they have functions to change their own outputs or programs by learning or other methods.

In the Guidelines, the definition of AI as described above, which comes from the standpoint of ensuring the technological neutrality set forth in the fourth basic philosophy, may apply to a variety of AI to be developed in the future depending on their functions. How to define AI in the Guidelines needs to be continuously discussed based on the trends of the technological progress of AI, etc.

⁵ Methods other than learning, which might cause AI software to change its own outputs or programs, include inferences based on data, information, and knowledge; and interactions with the environment through sensors, actuators, etc.

The Guidelines cover **development** at a stage of connection to networks, but not include one within closed spaces (such as laboratories or sandboxes in which security is sufficiently ensured) in view of respect for academic freedom, the magnitude of the impact on society, and so on.

4. AI R&D Principles

(Principles mainly concerning the sound development of AI networking and the promotion of the benefits of AI systems)

- 1) **Principle of collaboration**—Developers should pay attention to the interconnectivity and interoperability of AI systems.

(Principles mainly concerning mitigation of risks associated with AI systems)

- 2) **Principle of transparency**—Developers should pay attention to the verifiability of inputs/outputs of AI systems and the explainability of their judgments.
- 3) **Principle of controllability**—Developers should pay attention to the controllability of AI systems.
- 4) **Principle of safety**—Developers should take it into consideration that AI systems will not harm the life, body, or property of users or third parties through actuators or other devices.
- 5) **Principle of security**—Developers should pay attention to the security of AI systems.
- 6) **Principle of privacy**—Developers should take it into consideration that AI systems will not infringe the privacy of users or third parties.
- 7) **Principle of ethics**—Developers should respect human dignity and individual autonomy in R&D of AI systems.

(Principles mainly concerning improvements in acceptance by users et al.)

- 8) **Principle of user assistance**—Developers should take it into consideration that AI systems will support users and make it possible to

give them opportunities for choice in appropriate manners.

- 9) **Principle of accountability**—Developers should make efforts to fulfill their accountability to stakeholders including AI systems' users.

5. **Comments on AI R&D Principles**

- 1) **Principle of collaboration**—Developers should pay attention to the **interconnectivity and interoperability of AI systems.**

[Comment]

Developers should give consideration to the interconnectivity and interoperability⁶ between the AI systems that they have developed and other AI systems, etc. with consideration of the diversity of AI systems so that: (a) the benefits of AI systems should increase through the sound progress of AI networking; and that (b) multiple developers' efforts to control the risks should be coordinated well and operate effectively. For this, developers should pay attention to the followings:

- To make efforts to cooperate to share relevant information which is effective in ensuring interconnectivity and interoperability.
- To make efforts to develop AI systems conforming to international standards, if any.
- To make efforts to address the standardization of data formats and the openness of interfaces and protocols including application programming interface (API).
- To pay attention to risks of unintended events as a result of the interconnection or interoperations between AI systems that they have developed and other AI systems, etc.
- To make efforts to promote open and fair treatment of license agreements

⁶ The interoperability and interconnectivity in this context expects that AI systems which developers have developed can be connected to information-and-communication networks, thereby can operate with other AI systems, etc. in mutually and appropriately harmonized manners.

for and their conditions of intellectual property rights, such as standard essential patents, contributing to ensuring the interconnectivity and interoperability between AI systems and other AI systems, etc., while taking into consideration the balance between the protection and the utilization with respect to intellectual property related to the development of AI.

2) Principle of transparency—Developers should pay attention to the verifiability of inputs/outputs of AI systems and the explainability of their judgments⁷.

[Comment]

AI systems which are supposed to be subject to this principle are such ones that might affect the life, body, freedom, privacy, or property of users or third parties.

It is desirable that developers pay attention to the verifiability of the inputs and outputs of AI systems as well as the explainability of the judgment of AI systems within a reasonable scope in light of the characteristics of the technologies to be adopted and their use, so as to obtain the understanding and trust of the society including users of AI systems.

3) Principle of controllability—Developers should pay attention to the controllability of AI systems.

[Comment]

In order to assess the risks related to the controllability of AI systems, it is encouraged that developers make efforts to conduct verification and validation⁸ in advance⁹. One of the conceivable methods of risk assessment is to conduct

⁷ Note that this principle is not intended to ask developers to disclose algorithms, source codes, or learning data. In interpreting this principle, consideration to privacy and trade secrets is also required.

⁸ Verification and validation are methods for evaluating and controlling risks in advance. Generally, the former is used for confirming formal consistency, while the latter is used for confirming substantial validity. (See, e.g., The Future of Life Institute (FLI), *Research Priorities for Robust and Beneficial Artificial Intelligence* (2015)).

⁹ Examples of what to see in the risk assessment are risks of *reward hacking* in which AI systems formally achieve the goals assigned but substantially do not meet the developer's intents, and risks that AI systems work in ways that the developers have not intended due to

experiments in a closed space such as in a laboratory or a sandbox in which security is ensured, at a stage before the practical application in society.

In addition, in order to ensure the controllability of AI systems, it is encouraged that developers pay attention to whether the supervision (such as monitoring or warnings) and countermeasures (such as system shutdown, cut-off from networks, or repairs) by humans or other trustworthy AI systems are effective, to the extent possible in light of the characteristics of the technologies to be adopted.

4) Principle of safety—Developers should take it into consideration that AI systems will not harm the life, body, or property of users or third parties through actuators or other devices.

[Comment]

AI systems which are supposed to be subject to this principle are such ones that might harm the life, body, or property of users or third parties through actuators or other devices.

It is encouraged that developers refer to relevant international standards and pay attention to the followings, with particular consideration of the possibility that outputs or programs might change as a result of learning or other methods of AI systems:

- To make efforts to conduct verification and validation in advance in order to assess and mitigate the risks related to the safety of the AI systems.
- To make efforts to implement measures, throughout the development stage of AI systems to the extent possible in light of the characteristics of the technologies to be adopted, to contribute to the intrinsic safety (reduction of essential risk factors such as kinetic energy of actuators) and the functional safety (mitigation of risks by operation of additional control devices such as automatic braking) when AI systems work with actuators or other devices.

And

the changes of their outputs and programs in the process of the utilization with their learning, etc. For reward hacking, see, e.g., Dario Amodei, Chris Olah, Jacob Steinhardt, Paul Christiano, John Schulman & Dan Mané, *Concrete Problems in AI Safety*, arXiv: 1606.06565 [cs.AI] (2016).

- To make efforts to explain the designers' intent of AI systems and the reasons for it to stakeholders such as users, when developing AI systems to be used for making judgments regarding the safety of life, body, or property of users and third parties (for example, such judgments that prioritizes life, body, property to be protected at the time of an accident of a robot equipped with AI).

5) Principle of security—Developers should pay attention to the security of AI systems.

[Comment]

In addition to respecting international guidelines on security such as “OECD Guidelines for the Security of Information Systems and Networks,” it is encouraged that developers pay attention to the followings, with consideration of the possibility that AI systems might change their outputs or programs as a result of learning or other methods:

- To pay attention, as necessary, to the reliability (that is, whether the operations are performed as intended and not steered by unauthorized third parties) and robustness (that is, tolerance to physical attacks and accidents) of AI systems, in addition to: (a) confidentiality; (b) integrity; and (c) availability of information that are usually required for ensuring the information security of AI systems.
- To make efforts to conduct verification and validation in advance in order to assess and control the risks related to the security of AI systems.
- To make efforts to take measures to maintain the security to the extent possible in light of the characteristics of the technologies to be adopted throughout the process of the development of AI systems (“*security by design*”).

6) Principle of privacy—Developers should take it into consideration that AI systems will not infringe the privacy of users or third parties.

[Comment]

The privacy referred to in this principle includes spatial privacy (peace of personal

life), information privacy (personal data), and secrecy of communications. Developers should consider international guidelines on privacy, such as “OECD Guidelines on the Protection of Privacy and Transborder Flows of Personal Data,” as well as the followings, with consideration of the possibility that AI systems might change their outputs or programs as a result of learning and other methods:

- To make efforts to evaluate the risks of privacy infringement and conduct privacy impact assessment in advance.
- To make efforts to take necessary measures, to the extent possible in light of the characteristics of the technologies to be adopted throughout the process of development of the AI systems (“*privacy by design*”), to avoid infringement of privacy at the time of the utilization.

7) Principle of ethics—Developers should respect human dignity and individual autonomy in the R&D of AI systems.

[Comment]

It is encouraged that, when developing AI systems that link with the human brain and body, developers pay particularly due consideration to respecting human dignity and individual autonomy, in light of discussions on bioethics, etc.

It is also encouraged that, to the extent possible in light of the characteristics of the technologies to be adopted, developers make efforts to take necessary measures so as not to cause unfair discrimination resulting from prejudice included in the learning data of the AI systems.

It is advisable that developers take precautions to ensure that AI systems do not unduly infringe the value of humanity, based on the International Human Rights Law and the International Humanitarian Law.

8) Principle of user assistance—Developers should take it into consideration that AI systems will support users and make it possible to give them opportunities for choice in appropriate manners.

[Comment]

In order to support users of AI systems, it is recommended that developers pay attention to the followings:

- To make efforts to make available interfaces that provide in a timely and appropriate manner the information that can help users' decisions and are easy-to-use for them.
- To make efforts to give consideration to make available functions that provide users with opportunities for choice in a timely and appropriate manner (e.g., default settings, easy-to-understand options, feedbacks, emergency warnings, handling of errors, etc.). And
- To make efforts to take measures to make AI systems easier to use for socially-vulnerable people such as universal design.

In addition, it is recommended that developers make efforts to provide users with appropriate information considering the possibility of changes in outputs or programs as a result of learning or other methods of AI systems.

9) Principle of accountability—Developers should make efforts to fulfill their accountability to stakeholders including AI systems' users.

[Comment]

Developers are expected to fulfill their accountability for AI systems they have developed to gain users' trust in AI systems.

Specifically, it is encouraged that developers make efforts to provide users with the information that can help their choice and utilization of AI systems. In addition, in order to improve the acceptance of AI systems by the society including users, it is also encouraged that, taking into account the R&D principles (1) to (8) set forth in the Guidelines, developers make efforts: (a) to provide users et al. with both information and explanations about the technical characteristics of the AI systems they have developed; and (b) to gain active involvement of stakeholders (such as their feedback) in such manners as to hear various views through dialogues with diverse stakeholders.

Moreover, it is advisable that developers make efforts to share the information

and cooperate with providers et al. who offer services with the AI systems they have developed on their own.

Attachment: Roles Expected to Be Taken by Related Stakeholders

Based on the purpose of the Guidelines, the stakeholders of relevant industries, academia, and governments are expected to play the following roles, for example:

1. Each country's government and international organizations are expected to make efforts to improve the environment for promoting **dialogues among various stakeholders** such as governments, international organizations, developers, users including civil society, in the operation and review of the Guidelines.
2. Relevant stakeholders such as developers and users including the civil society are expected to make efforts to participate in the dialogues mentioned above, **share best practices** conforming to the Guidelines, and also share common perceptions about the promotion of the benefits and the mitigation of the risks of AI, while ensuring the diversity of discussions over AI.
3. Standardization bodies and other related entities are expected to **prepare and release recommended models** that conform to the Guidelines.
4. Each country's government is expected to: (a) provide assistance **to AI-developer communities** towards solving challenges such as increasing the benefits from AI and mitigating the risks as stated in the Guidelines; and (b) actively **promote policies to support the R&D of AI**.

The Conference toward AI Network Society

1. Host

Director-General, Institute for Information and Communications Policy (IICP), Ministry of Internal Affairs and Communications, the Government of Japan

2. Date of Establishment

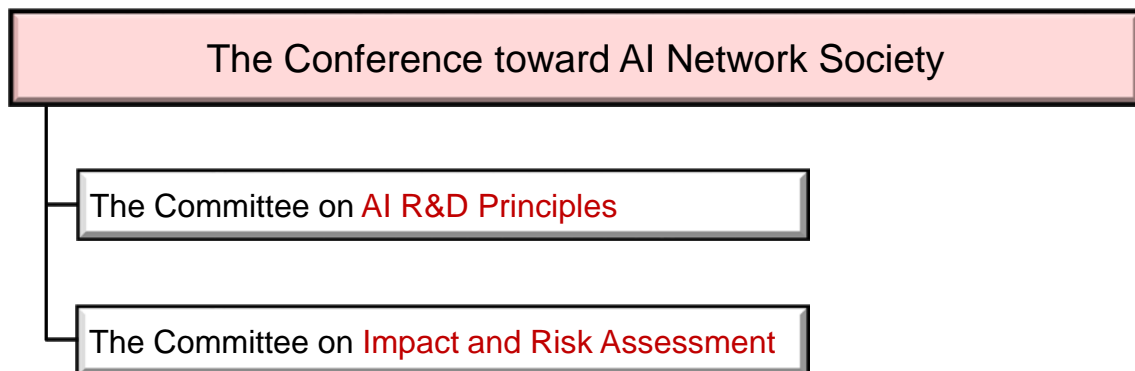
31 October, 2016

3. Purpose

The Conference was established as a conference of advisory experts to study social, economic, ethical, and legal issues including the items below, toward promoting AI networking in the entire society.

- To prepare a draft which will be used for international discussions toward formulating the “AI R&D Guidelines”
- To assess impact and risks brought by AI networking to each sector of the society

4. Structure



A List of Members of the Conference toward AI Network Society

Chairperson	Osamu SUDOH	Professor, Graduate School of Interdisciplinary Information Studies, the University of Tokyo; Director for the University of Tokyo Center for Research and Development of Higher Education
Vice Chairperson	Hitoshi MITOMO	Professor, Waseda University Graduate School of Asia-Pacific Studies
Members	Toshio IWAMOTO	President and CEO, NTT DATA Corporation
	Nobuhiro ENDO	Chairman of the Board (Representative Director), NEC Corporation
	Hiroshi OHASHI	Professor, the University of Tokyo Graduate School of Economics
	Takehiro OHYA	Professor, Keio University Faculty of Law
	Masaru KITSUREGAWA	Professor, Institute of Industrial Science, the University of Tokyo; Director General, National Institute of Informatics
	Eily KEINAN	Country General Manager and President, IBM Japan, Ltd.
	Noriko KONDO	Secretary-General, the Study Group for Elderly-assisting Technologies
	George SHISHIDO	Professor, the University of Tokyo Graduate Schools for Law and Politics
	Toshiya JITSUZUMI	Professor, Chuo University Faculty of Policy Studies
	Hideaki SHIROYAMA	Professor, the University of Tokyo Graduate Schools for Law and Politics
	Fumio SHIMPO	Professor, Keio University Faculty of Policy Management
	Masashi SUGIYAMA	Director, RIKEN Center for Advanced Intelligence Project; Professor, Graduate School of Frontier Sciences, the University of Tokyo
	Shoko SUZUKI	Professor, Kyoto University Graduate School of Education
	Koichi TAKAHASHI	Team Leader, Laboratory for Biochemical Simulation, RIKEN Quantitative Biology Center
Katsunori TANIZAKI	Director and Senior Managing Executive Officer, Group CIO, Sumitomo Mitsui Banking Corporation	
Hiroshi NAKAGAWA	Professor, Information Technology Center, the University of Tokyo	
Takafumi NAKANISHI	Associate Professor, International University of Japan Center for Global Communications	
Toyoaki NISHIDA	Professor, Kyoto University Graduate School of Informatics	

	Norihiro HAGITA	Director, ATR Intelligent Robotics and Communication Laboratories, Advanced Telecommunications Research Institute International
	Yoshiaki HASHIMOTO	Professor, the University of Tokyo Interfaculty Initiative in Information Studies
	Shuya HAYASHI	Professor, Nagoya University Graduate School of Law
	Toshiaki HIGASHIHARA	Director, Representative Executive Officer, President & CEO, Hitachi, Ltd.
	Susumu HIRANO	Dean, Chuo University Graduate School of Policy Studies; Professor, Chuo University Faculty of Policy Studies
	Takuya HIRANO	President, Microsoft Japan Co., Ltd.
	Susan POINTER	Senior Director & Regional Lead, Public Policy & Government Relations, Google Inc.
	Koichi HORI	Professor, the University of Tokyo Graduate School of Engineering
	Yutaka MATSUO	Project Associate Professor, the University of Tokyo Graduate School of Engineering
	Jun MURAI	Professor and Dean, Keio University, Faculty of Environment and Information Studies
	Norio MURAKAMI	President, Norio Murakami Office Co., Ltd.
	Hiroyuki MORIKAWA	Professor, the University of Tokyo Graduate School of Engineering
	Hiroshi YAMAKAWA	Chief of the Dwango Co., Ltd. Artificial Intelligence Laboratory
	Masami YAMAMOTO	Chairman, Fujitsu Limited
Executive Advisers	Yuichiro ANZAI	Professor Emeritus, Keio University (the Former President of Keio University)
	Makoto NAGAO	Professor Emeritus, Kyoto University (the Former President of Kyoto University)
	Shojiro NISHIO	President of Osaka University
	Junichi HAMADA	Professor Emeritus, the University of Tokyo (the Former President of the University of Tokyo)
Observers	Cabinet Office, National Strategy Office of Information and Communications Technology	
	Cabinet Secretariat, Secretariat for Personal Information Protection Commission	
	Ministry of Education, Culture, Sports, Science and Technology	
	Ministry of Economy, Trade and Industry	
	National Institute of Information and Communications Technology	

Japan Science and Technology Agency
Institute of Physical and Chemical Research
National Institute of Advanced Industrial Science and Technology
Council on Competitiveness-Nippon

As of July 25, 2017

The order of the Japanese syllabary except for the Chairperson and the Vice
Chairperson

A List of Members of the Committee on AI R&D Principles The Conference toward AI Network Society

Chairperson	Susumu HIRANO	Dean, Chuo University Graduate School of Policy Studies; Professor, Chuo University Faculty of Policy Studies
Vice Chairperson	George SHISHIDO	Professor, the University of Tokyo Graduate Schools for Law and Politics
Technical Advisor	Koichi HORI	Professor, the University of Tokyo Graduate School of Engineering
Members	Yoichiro ITAKURA	Attorney at Law
	Arisa EMA	Assistant Professor, Komaba Organization for Educational Excellence College of Arts and Sciences Project, the University of Tokyo
	Katsumi EMURA	Executive Vice President and CTO, NEC Corporation
	Takehiro OHYA	Professor, Keio University Faculty of Law
	Hisashi KASHIMA	Professor, Kyoto University Graduate School of Informatics
	Keisuke KATSUKI	Secretary-General, Movements for Internet Active Users
	Shigeo KAWASHIMA	Associate Professor, Aoyama Gakuin Women's Junior College, Department of Contemporary Liberal Arts
	Shikou KIKUTA	Senior Vice President, Fujitsu Limited
	Tsuoyoshi KITANI	Director and Executive Vice President, NTT Data Corporation
	Minao KUKITA	Associate Professor, Nagoya University Graduate School of Information Science
	Kazushi KUSE	Vice President, IBM Research & Development, IBM Japan, Ltd.
	Satoshi KURIHARA	Director, Artificial Intelligence eXploration Research Center, UEC Tokyo
	Tatsuya KUROSAKA	Project Associate Professor, Keio University Graduate School of Media and Governance
	Masahiro KOBAYASHI	Attorney at Law
	Akira SAKAKIBARA	Executive Officer and CTO, Microsoft Japan Co., Ltd.
	Hiroyuki SANBE	Attorney at Law
	Toshiya JITSUZUMI	Professor, Chuo University Faculty of Policy Studies
	Hideaki SHIROYAMA	Professor, the University of Tokyo Graduate Schools for Law and Politics

Fumio SHIMPO	Professor, Keio University Faculty of Policy Management
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Norihiro SUZUKI	Vice President and Executive Officer, CTO and General Manager of Research & Development Group, Hitachi, Ltd.
Koichi TAKAHASHI	Team Leader, Laboratory for Biochemical Simulation, RIKEN Quantitative Biology Center
Hideaki TAKEDA	Professor, Principles of Informatics Research Division, National Institute of Informatics
Mayu TERADA	Associate Professor, International Christian University, College of Liberal Arts
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Takafumi NAKANISHI	Associate Professor, International University of Japan Center for Global Communications
Norihiro HAGITA	Director, ATR Intelligent Robotics and Communication Laboratories, Advanced Telecommunications Research Institute International
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Shinya FUKAMACHI	Professor, Graduate School of Law and Politics, Rikkyo University
Kensaku FUKUI	Attorney at Law
Yutaka MATSUO	Project Associate Professor, the University of Tokyo Graduate School of Engineering
Norio MURAKAMI	President, Norio Murakami Office Co., Ltd.
Hiroshi YAMAKAWA	Chief of the Dwango Co., Ltd. Artificial Intelligence Laboratory
Harumichi YUASA	Advisor to the President; Professor, the Institute of Information Security Faculty of Information Security

As of July 25, 2017

The order of the Japanese syllabary except for the Chairperson, the Vice Chairperson and the Technical Advisor

A List of Members of the Committee on Impact and Risk Assessment

The Conference toward AI Network Society

Chairperson	Hideaki SHIROYAMA	Professor, the University of Tokyo Graduate Schools for Law and Politics
Vice Chairperson	Takehiro OHYA	Professor, Keio University Faculty of Law
Members	Yoichiro ITAKURA	Attorney at Law
	Shin-ichiro INABA	Professor, Department of Sociology, Meiji-Gakuin University
	Tomohiro INOUE	Associate Professor, Komazawa University Faculty of Economics
	Arisa EMA	Assistant Professor, Komaba Organization for Educational Excellence College of Arts and Sciences Project, the University of Tokyo
	Katsumi EMURA	Executive Vice President and CTO, NEC Corporation
	Shinya OUCHI	Professor, the Kobe University Graduate School of Law
	Yoshihiro OHTA	Project Professor, the University of Tokyo Graduate School of Mathematical Sciences
	Hiroshi OHASHI	Professor, the University of Tokyo Graduate School of Economics
	Takafumi OCHIAI	Attorney at Law
	Keisuke KATSUKI	Secretary-General, Movements for Internet Active Users
	Daisuke KAWAI	Assistant Professor, the University of Tokyo Interfaculty Initiative in Information Studies
	Minao KUKITA	Associate Professor, Nagoya University Graduate School of Information Science
	Kazushi KUSE	Vice President, IBM Research & Development, IBM Japan, Ltd.
	Tatsuya KUROSAKA	Project Associate Professor Keio University Graduate School of Media and Governance
	Noriko KONDO	Secretary-General, the Study Group for Elderly- assisting Technologies
	Akira SAKAKIBARA	Executive Officer and CTO, Microsoft Japan Co., Ltd.
	Toshiya JITSUZUMI	Professor, Chuo University Faculty of Policy Studies
	Yoshitaka SUGIHARA	Public Policy & Government Relations at Google Japan G.K.
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Norihiro HAGITA	Director, ATR Intelligent Robotics and Communication Laboratories, Advanced Telecommunications Research Institute International
Shuya HAYASHI	Professor, Nagoya University Graduate School of Law
Masayuki HAYASHI	Visiting Research Fellows, International University of Japan Center for Global Communications
Hirofumi HARA	Director, Fujitsu Laboratories Ltd.
Kensaku FUKUI	Attorney at Law
Norio MURAKAMI	President, Norio Murakami Office Co., Ltd.
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As of July 25, 2017

The order of the Japanese syllabary except for the Chairperson and the Vice Chairperson