

# Global Forum on AI Network Society Towards an AI-Ready Society

## Overview

With the participation of experts and executives from a wide range of industries, academic, and public sectors, the international symposium was held to contribute to the resolution of social issues as an avenue for discussions on the future advancement of the AI society and data economies and the possibility of using AI for problems caused by the COVID-19 pandemic.

○ Date and time: Monday, March 1, 2021 9:30 to 18:00 (Online)

9:30-9:35	Opening Remarks	TAKEDA Ryota Minister for Internal Affairs and Communications
9:35-10:05	Keynote Lecture	Robert J. GORDON Stanley G. Harris Professor in the Social Sciences, Professor of Economics, Northwestern University "Will Robots and AI Revolutionize Productivity Growth?"
10:05-10:40	Keynote Dialogue	Robert J. GORDON Stanley G. Harris Professor in the Social Sciences, Professor of Economics, Northwestern University IWATA Kazumasa President, Japan Center for Economic Research
10:40-12:00	Panel Discussion	"Data Economy Spurred by Artificial Intelligence" <b>Moderator :</b> OHASHI Hiroshi Dean, Graduate School of Public Policy, Professor of Economics, The University of Tokyo <b>Speakers :</b> ITO Banri Professor, College of Economics, Aoyama Gakuin University URAKAWA Shinichi Chair, Sub-Committee on Digital Economy, Japan Business Federation (KEIDANREN) OTA Yuichi Founder and CEO, DataSign Inc. SHIMADA Taro Executive Officer and Corporate Senior Vice President, Chief Digital Officer, Toshiba Corporation WATANABE Tsutomu Dean, Graduate School of Economics, Professor of Economics, The University of Tokyo
12:00-13:00	Break	
13:00-13:20	Honor Lecture	SUDO Osamu Professor, Faculty of Global Informatics, Chuo University/ Project Professor, Graduate School of Interdisciplinary Information Studies, The University of Tokyo
13:20-13:50	Special lecture	Arun SUNDARARAJAN Harold Price Professor of Entrepreneurship, Professor of Technology, Operations and Statistics New York University's (NYU) Stern School of Business "Digital Regulation: Ethics, Fairness And Governance In An Era Of Platforms And Artificial Intelligence"
13:50-14:20	Special lecture	OKUNO Yasushi Professor, Department of Biomedical Data Intelligence, Graduate School of Medicine, Kyoto University "Challenges in Drug Development for COVID-19 Using AI and Simulation Technologies"

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14:20-15:40	Panel Discussion	<p>“Expectations for AI in the New Normal”</p> <p><b>Moderator :</b> SEKIGUCHI Waichi President, MM Research Institute/ Former Editorial Writer, Nikkei, Inc.</p> <p><b>Speakers :</b> ISHIDO Nanako Professor, Graduate School Of Media Design, Keio University ISHIYAMA Ko President and CEO, ExaWizards Inc. OKAMOTO Seishi Fellow, Head of Artificial Intelligence Laboratory, Fujitsu Laboratories Ltd. NAKAGAWA Hiroshi Artificial Intelligence Research Group Team Leader in Society RIKEN Center for Advanced Intelligence Project (AIP) FUKUHARA Masahiro Founder and CEO, Institution for a Global Society/ Project Professor, Keio University</p>
15:40-15:55		Break
15:55-16:15	Lecture	Andrew W. WYCKOFF Director, OECD Directorate for Science, Technology and Innovation(OECD) “OECD work on Trustworthy AI and on the Value of Data”
16:15-16:35	Lecture	HIRANO Susumu Professor and Dean, Faculty of Global Informatics, Chuo University “Ethical, Legal, and Social Implications of Artificial Intelligence”
16:35-17:55	Panel Discussion	<p>“Governing the Future of AI-Ready Society”</p> <p><b>Moderator :</b> SUDO Osamu Faculty of Global Informatics, Chuo University/ Project Professor, Graduate School of Interdisciplinary Information Studies, The University of Tokyo</p> <p><b>Speakers :</b> IWAMOTO Toshio Principal Executive Advisor, NTT DATA Corporation KOZUKA Soichiro Professor of law, Gakushuin University SANBE Hiroyuki Attorney-at-Law/ Guest Professor, Research Center on Ethical, Legal and Social Issues, Osaka University JITSUZUMI Toshiya Professor, the Faculty of Policy Studies Chuo University FUJITA Masahiro VP, Senior Chief Researcher, AI Collaboration Office, Sony Corporation Director, Sony AI</p>
17:55-18:00	Closing Remarks	SHINTANI Masayoshi, State Minister for Internal Affairs and Communications

※The speakers’ affiliations and job titles are as of the time of the Symposium

# Sessions Overview ①

## Keynote Lecture

### Robert J. GORDON

Stanley G. Harris Professor in the Social Sciences, Professor of Economics, Northwestern University



## “Will Robots and AI Revolutionize Productivity Growth?”

- The emergence of AI and the expansion of digital networks were expected to drive U.S. economic growth. However, the U.S. growth rate was 0.9% in 2010-2020, less than a quarter of the best decade of 1940-1950. Japan's growth rate is also low.
- There are predictions of a Fourth Industrial Revolution wherein robots and AI replace human workers. However, unlike human intelligence, AI is limited and less flexible.
- Due to the advent of computers, some jobs were lost and replaced by others. When the spreadsheet software Excel was introduced in the market, the number of bookkeepers and accounting and auditing clerks decreased from 2 million to 1 million. Conversely, the number of accountants and auditors increased from 0.5 million to 1.7 million. Jobs were created for management analysts and financial managers and their numbers increased to 2 million. Over the last two decades, middle skill jobs have decreased, while the demand for high skill jobs has increased.
- Robots are not new technology as they were introduced in the 90s. The U.S. investment in robots in 2018 was less than 0.6% of the total durable goods investment. Offshore outsourcing and import competition are a major factors in the decrease in jobs.
- Polarization of high-skilled work and labor-intensive, low-paying work that cannot be done by AI will continue. The role of AI and robots in improving productivity is limited.

## Honor Lecture

### SUDO Osamu

(Professor, Faculty of Global Informatics, Chuo University/ Project Professor, GSII, The University of Tokyo)



- Innovative technologies such as AI, IoT, Big Data, 5G, and Quantum computer have been developed and implemented, leading to revolutionary paradigm shifts in the world's social and industrial structures. It is important to leverage change to improve culture and people's capabilities and to create a framework that contributes to the Sustainable Development Goals, “SDGs”.
- There is active debate on the ethical aspects of AI. In March 2019, the Japanese government clearly stipulated the seven principles of AI as a government-wide initiative. These are “Human-Centric Principles”, “Privacy Principles”, “Principles for Ensuring Security”, “Principles for Innovation”, “Principles for Education and Literacy”, “Principles for Securing Fair Competition”, and “Principles for Fairness, Accountability, and Transparency”.
- Prior to this, in April 2016, the G7 Information and Communications Ministerial Meeting in Takamatsu city in Kagawa agreed on the need for international discussions on AI development principles. Subsequently, the “Draft AI R&D Guidelines” and the “Draft AI Utilization Principles” were announced in July 2017 and July 2018, respectively. They were utilized by OECD Recommendations of the Council on Artificial Intelligence in May 2019, leading to the G20 AI Principles in June 2019.
- United Nations Educational, Scientific and Cultural Organization (UNESCO) is studying the principles of AI ethics, and the resolutions of the European Commission are also important. For the sound development of Japanese society, it is important to further advance the discussion on the ethics of AI.

# Sessions Overview ②

## Special Lecture

### Arun SUNDARARAJAN

(Harold Price Professor of Entrepreneurship, Professor of Technology, Operations and Statistics New York University's (NYU) Stern School of Business)



## Special Lecture

### OKUNO Yasushi

(Professor, Dept. Biomedical Intelligence, Graduate School of Medicine, Kyoto University)



## “Digital Regulation: Ethics, Fairness And Governance In An Era Of Platforms And Artificial Intelligence”

- During the recent U.S. presidential inauguration, we witnessed an unprecedented handing over of the responsibility of maintaining social order to digital platformers.
- With digitization, platformers are expanding and growing with users. In 10 years, they will account for the top 10 market capitalizations of megacorporatons. Platformers will take on politics and social responsibilities as they continue to grow. Therefore, responsibilities and rules should be clarified and published.
- AI is spreading into the economy and daily life. It is used in e-commerce (EC) recommendations, recruitment, human resources evaluation, and crime prevention, contributing to the evolution of the society.
- However, some AI algorithms are suspected of being biased according to gender and/or race. When AI learns from biased data, it simply reinforces the bias unless corrected. It is necessary to use fair data and set a benchmark.
- There is concern that digitization will exacerbate inequality and widen gaps. The automation and robotics deployments may aggravate unemployment. However, the COVID-19 pandemic has pushed work style reform about three years earlier than we expected. Business styles will change, and more opportunities will come.

## “The Challenge of Developing a New Corona Virus Therapy Using AI Simulation”

- Last summer, we used the supercomputer “Fugaku” of the Institute of Physical and Chemical Research (RIKEN) to identify candidates for COVID-19 treatment. By simulating through molecular dynamics calculation, we searched from 2,128 existing candidate agents including stomach and cold medicines for target proteins that can hold virus multiplication. Our study identified “niclosamide” as a candidate. At the time, Fugaku had just started operating and the calculation took 10 days. Now, the upgraded software can perform calculations in 2 days.
- Much is expected from using AI in drug discovery as this normally requires several years and incurs huge R&D costs. By repeating the predictions of chemosynthesis and activity evaluation using AI, the process of searching for a drug candidate, including activity improvement, solubility improvement, and toxicity avoidance, can be accelerated.
- COVID-19 cases may be either mild or serious. If we can clarify the mechanism, we can detect target molecules for treatment. With no historical data available for COVID-19, we use the Bayesian network, which combines various events with probabilities and represents them in figures. We calculated gene changes driven by infected viral load and identified candidate genes that could suppress the severity.
- Drug discovery AI is being developed in many companies and organizations, including Kyoto University and RIKEN. The hybrid use of supercomputer simulation and AI, as well as the introduction of big data should bring forth an evolution in medical drug research.

# Sessions Overview ③

## Lecture

### Andrew W. WYCKOFF

(Director, OECD Directorate for Science, Technology and Innovation)



## “OECD work on Trustworthy AI and on the Value of Data”

- Technology is advancing at a rate that policy cannot keep up with. The OECD is working to fill this gap from multiple perspectives.
- Last year, policy observatory and expert groups were established to promote the global implementation of AI principles. In February of this year, a large-scale online conference on AI-WIPS was held, focusing on research on AI, the labor market, and productivity. The online platform, “OECD AI Policy Observatory (OECD.AI),” has collected evidence that can be used for policy-making.
- For example, AI-related live news, research publications and the penetration of AI skills are available. It provides information on more than 600 policies and initiatives from more than 60 countries.
- ONE AI is an expert group that is developing guidance on implementing AI principles. More than 200 experts participate and provide inputs on policies and technologies. ONE AI continues the discussion in three working groups: “Classifying AI Systems,” “Tools for Trustworthy AI” and “National AI Policies”.
- The OECD will start the work on data governance. Measuring the value of data, which have been rapidly increasing in recent years, is an important theme. We analyze it from four perspectives: “expenditure on data storage,” “value of trade in products delivered through data flows,” “market valuation of data-driven firms,” and “revenue from sales of data products.”. The OECD is aiming to address the challenges in calculating the value of startup companies. The OECD continues to work hard for better guidance through multilateralism.

## Lecture

### HIRANO Susumu

(Professor and Dean, Faculty of Global Informatics, Chuo University)



## “Ethical, Legal, and Social Implications of Artificial Intelligence”

- A reason that Japan could contribute to the AI principles of OECD and G20 is that its non-binding approach (soft law) is midway between that of Europe which favors precautionary principles, and the United States which favors liberal development.
- To create socially acceptable AI, it is important to consider ELSI (Ethical, Legal, and Social Implications) separately from science and technology. There is an idea that for the sake of science, Artificial General Intelligence in its developmental phase should not be the subject of soft law. However, social security should have priority over science.
- It is important for AI engineers to learn ethics and social sciences. Traditionally, the legal world emphasizes literature and uses stories to train lawyers. AI often appears in literature, movies, and academic papers; as such, the messages conveyed in literature and movies should be taken seriously.
- Recently, there has been a proposal in Europe to regulate AI by statutory laws rather than soft law. When AI is implemented, it will be necessary to reconsider the civil liability regime. It is said that clear rules are desirable for a new society and that deterrence is necessary for high-risk AI. In AI governance, it would be desirable to call attention toward fault-based liability in case of bilateral risks while suppressing behavior through strict liability in the case of unilateral risks.

# Sessions Overview ④

## Keynote Dialogue

### Robert J. GORDON

Stanley G. Harris Professor in the Social Sciences, Professor of Economics, Northwestern University



### IWATA Kazumasa

(President, Japan Center for Economic Research)



- In the U.S., the Information Revolution of 1994-2004 resulted in increased labor productivity while it has remained unchanged since the mid-1990s in Japan. Chips and hardware have evolved in Japan while software has not. In the U.S., software was invested in as an intangible asset, leading to significant innovation. In Japan, mainly in the manufacturing industry, there is a huge gap in the productivity between large and small and medium-sized enterprises, and the productivity of the service industry is very low. There is concern that high-skilled workers will be concentrated in large, highly productive companies, leaving small and medium-sized companies behind in digitization. (Iwata)
- In the U.S., the working population will increase despite drops in the fertility rate, mainly due to immigrants. In Japan and China, the working population will fall significantly. (Gordon)
- In terms of gross domestic product (GDP), the Japan Center for Economic Research expects China to expand its economic scale and overtake the U.S. by the end of the decade. Demographic changes and the catch-up effect on the U.S. have subsequently diminished, resulting in slower growth. Inequality, education, demography, and debt are obstacles to the U.S. economic growth, as well as democracy related, including healthcare, racial and social injustice, and the divide between the state and the society. (Iwata)
- Healthcare problems in the U.S. must be addressed separately from inequality issues. Inequality is a matter of money, but health is a matter of basic human rights and welfare. The U.S. is the only major country wherein the government does not provide equal healthcare to its citizens.

In the U.S., private medical insurance is provided through employment, and many low-income jobs do not provide healthcare. Adding to that is the high cost of college education, leaving students in debt. Middle- and low-income people in the U.S. might have a higher per capita income than in Japan and Europe, but the situation is worse due to the burden of massive healthcare costs and the need to repay student fees. (Gordon)
- The middle-income group is polarized depending on their skills. As democracy is sustained by a large number of middle-income people, it will be difficult to maintain democracy when the standard of life deteriorates due to polarization. Polarization, or the social and racial divide of the middle-income group, remains a problem in the U.S.

The U.S. dominates in basic research on AI technology, while its application to business is considerably advancing in China. China created an AI-oriented ecosystem and, in combination with the manufacturing industry, pushed the Chinese economies to a global level. More than 80% of Chinese companies in almost all industries now adopt AI, while the U.S. and Japan are far behind, with rates of 51% and 39%, respectively. (Iwata)
- China is leading in electric vehicle and battery development, as well as in the production of green energy and solar panels. Although China's per capita income will not catch up with the U.S. in the next 30 years, its productivity in the manufacturing sector will catch up much earlier. (Gordon)

# Sessions Overview ⑤

## Panel Discussion

## “Data Economy Spurred by Artificial Intelligence”

### [Moderator]

#### OHASHI Hiroshi

(Dean, Graduate School of Public Policy, Professor of Economics, The University of Tokyo)



### [Speakers]

#### ITO Banri

(Professor, College of Economics, Aoyama Gakuin University)



#### URAKAWA Shinichi

(Chair, Sub-Committee on Digital Economy, KEIDANREN)



#### OTA Yuichi

(Founder and CEO DataSign Inc.)



#### SHIMADA Taro

(Executive Officer and Corporate Senior Vice President, Chief Digital Officer, Toshiba Corporation)



#### WATANABE Tsutomu

(Dean, Graduate School of Economics, Professor of Economics, The University of Tokyo)



- There are three issues in measuring the economic value of data. First, data is regarded as an intangible asset yet recorded accounting-wise. Second, information (e.g., customer information) is often held in the company and cannot be shared outside. Lastly, the value depends on the context in which the data is collected and used. (Ito)
- I do business in deriving statistics from commodity prices. Real time statistics, if available, would be very useful not only for institutional investors, but also during emergencies such as COVID-19. It is the time to consider the privatization of statistics. (Watanabe)
- The so-called “the 2000 issues,” which indicates the presence of approximately 2000 rules for respective local governments, can be a hindrance in promoting digital transformation (DX) of Japan. How should we utilize data while protecting personal information? Standardization and collaboration on rules are also important to promote international data flow. (Urakawa)
- The value of the data depends on the user and how they use it. If data is not utilized, its market value is close to zero. (Shimada)
- To promote data flow, value standards should be established, technical aspects should be developed, and market should be created. I want people with aspirations who could go beyond their own company’s mission to connect and promote commercialization which will help the entire market grow. (Urakawa)
- All data originating from people, either from shopping or moving, is personal. It should not be used without the owner’s consent and obviously, it should not be sold. Data transfer is acceptable if it is transparent enough for the owner to see. Without a mechanism for such networks to function automatically, there is no market development. (Shimada)
- Data flow between companies has so far not been successful because these companies are not willing to give information that may have an impact on sales. Enabling individuals to distribute data collected by themselves would eventually result in data flow between companies. The use of diverse data from many companies could expand opportunities. (Ota)
- The market should be fully autonomous, decentralized, and there should be a mechanism that allows companies to decide to retain or share data in some way. The right to control data should be on the individual, and this is an era in which such a problem can be solved technically. (Urakawa)
- Many companies have expanded into Asia. Japan needs to take leadership in providing reliable and free data flow. (Ito)
- The privatization of statistics, data flow, and data value are all connected. It is important to continue discussions from various perspectives. (Ohashi)

# Sessions Overview ⑥

## Panel Discussion

## “Expectations for AI in the New Normal”

### [Moderator]

#### SEKIGUCHI Waichi

(President, MM Research Institute,  
Former Editorial Writer, Nikkei, Inc.)



### [Speakers]

#### ISHIDO Nanako

(Professor, Graduate School of  
Media Design, Keio University)



#### ISHIYAMA Ko

(President and CEO,  
ExaWizards Inc.)



#### OKAMOTO Seishi

(Fellow, Head of Artificial  
Intelligence Laboratory, Fujitsu  
Laboratories Ltd.)



#### NAKAGAWA Hiroshi

(Artificial Intelligence Research  
Group Team Leader in Society,  
RIKEN Center for Advanced  
Intelligence Project)



#### FUKUHARA Masahiro

(Founder and CEO, Institution  
for a Global Society/ Project  
Professor, Keio University)



- Behavioral change occurred in society under the COVID-19 pandemic, and many problems became apparent. AI is expected to be a solution for these problems. (Sekiguchi)
- We are promoting a new work style under the concept “Work Life Shift” which is centered on telework. Society and businesses are transforming as we consistently provide new values and trusted AI. (Okamoto)
- In Japan, the delay in digitization became apparent as we tried to respond to COVID-19. Although a digital agency is being set up with the aim to promote DX, would it be able to function across ministries and agencies which traditionally operate in silos? The resistance to digitalize persists. (Nakagawa)
- Psychological factors are significant. We provide an AI-based system to analyze and evaluate employees’ relationships through online communication. It measures the frequency at which a subordinate speaks and how many times they smile at their supervisors. By visualizing the current situation and improving it, psychological safety and relationships will be strengthened. (Ishiyama)
- In April last year, only 5% of national schools had interactive online classes. The digitization of schools has not progressed. We distributed one terminal per student under the GIGA School Initiative, but it would not have been implemented without the pandemic. (Ishido)
- The rapid advancement of AI makes knowledge and skills obsolete faster than ever, and the education to strengthen basic soft skills has become the focus of attention. However, soft skills cannot be easily evaluated. Therefore, the AI-adjusted 360-degree evaluation is utilized for human resource development. It eliminates biases such as educational background and evaluates creativity more accurately. (Fukuhara)
- To accelerate AI use and DX, it is necessary to understand that a digital tool has more advantages than disadvantages. In the field of education, as AI use and DX proceeds, regulatory reforms such as the requirements for school establishment should be implemented accordingly. (Ishido)
- AI will not progress unless it has a purpose that makes people want to use it. It will be essential to motivate people to want to use it. (Ishiyama)
- It is important to challenge people. Showing what can be done with AI will help people come up with new measures. High-definition AI analysis has been found to be useful for online communication. (Okamoto)
- Securing IT human resources is important. STEM education, which is basic education in science and mathematics, should be provided in the humanities courses as well. (Nakagawa)
- In educational reform, university entrance exams also need to be changed. Companies are also required to change their recruitment policies. (Fukuhara)



# Sessions Overview ⑦

## Panel Discussion

## “Governing the Future of AI-Ready Society”

### 【Moderator】

#### SUDO Osamu

(Professor, Faculty of Global Informatics, Chuo University/  
Project Professor, GSII,  
The University of Tokyo)



### 【Speakers】

#### IWAMOTO Toshio

(Principal Executive Advisor,  
NTT DATA Corporation)



#### KOZUKA Soichiro

(Professor of law,  
Gakushuin University)



#### SANBE Hiroyuki

(Attorney-at-Law, Guest Professor,  
Research Center on Ethical, Legal  
and Social Issues, Osaka University)



#### JITSUZUMI Toshiya

(Professor, the Faculty of Policy  
Studies Chuo University)



#### FUJITA Masahiro

(VP, Senior Chief Researcher, AI  
Collaboration Office, Sony  
Corporation Director, Sony AI)



- In order for AI to be accepted by society, it is important to address consumers concerns. (Sudo)
- NTT DATA announced five AI guidelines in 2019. NTT DATA also formulated the AI development methodology which we would like to publish in the future. We have AI use cases in various sectors such as AI-based medical imaging support solution. (Iwamoto)
- We issued the AI Ethical Guidelines in 2018 and ensured corporate support. With these rules, we will confirm data transparency and AI-specific privacy protection. In terms of electronic products, we identify the risks during the planning phase and take the necessary measures. (Fujita)
- One reason that we need AI Principles is that we need consumers to trust AI. It is important for AI not to be an obstacle to human rights and freedom. It should be viewed as an issue of supply chains and contractual governance. (Kozuka)
- Japan leads other countries in the principles of using AI. The public-private international collaborative organization, GPAI (Global Partnership on AI) was established last year to push for the development and use of responsible AI. The Japanese Principles were chosen as guidelines for reference. (Jitsuzumi)
- It is important for Japan to address AI ethics while closely observing trends in Europe and the U.S. There is no AI law at present, and the interpretation of AI in the law without assuming AI is difficult. Its legal status is uncertain, for example, in smart city. (Sanbe)
- Applying AI to real-world projects would require defining the AI development methodology and continuous review of the AI models. (Iwamoto)
- Problems regarding AI ethics should be separated into safety and human rights issues. Those problems should be shared among stakeholders. (Fujita)
- It is necessary to promote the value of AI that is created under ethical principles. (Jitsuzumi)
- In the future, it will be common for businesses to spend on AI ethics. (Iwamoto)
- It is important to gain the trust of consumers so that corporate brands will be empowered. (Fujita)
- It is important to examine the laws and ethics from the conceptual stage of AI business. (Sanbe)
- Changes in corporate behavior are required to make the policy a tool for behavioral transformation. Providing insurance at an advantageous premium to companies that incorporate AI ethics may be a viable option. (Kozuka)
- The relation with SDGs is also emphasized in GPAI. Since even specialists have limited information, I would like companies to publish their use of AI. (Jitsuzumi)
- It is important to have continuous multiple stakeholder discussions. Increasing the level of the entire industry, human resources development, and collaboration between the public and private sectors is also key. (Sudo)