

U.S.-Japan Research Collaboration in the Global Digital Era: The Japan-U.S. Digital Innovation Hub Workshop

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U.S.-JAPAN HIGHER EDUCATION ENGAGEMENT STUDY (USJP HEES)

This case study is part of a larger study by the American Council on Education (ACE). This case study and the accompanying live, interactive database, real-time analysis, fact sheet, and infographics provide a foundation to capture U.S.-Japan higher education institutional partnership activities.

The goals of USJP HEES are to improve mutual understanding and cooperation within the U.S.-Japan higher education community and to capitalize on its strengths within the global higher education context.

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Visit www.acenet.edu/usjp-hees to learn more about the project.

Introduction

The Japan-U.S. Digital Innovation Hub Workshop is an initiative of U.S. and Japanese institutions of higher education that aims to establish a consortium for collaboration on joint research and education in the fields of data science, artificial intelligence (AI), and cybersecurity. The annual workshops provide lectures and encourage debates to promote bonds between research institutions of the two countries, allowing for synergistic sharing of knowledge and resources for developing advances in these fields. Participants have included many top-level representatives of government agencies and industries from both countries.

Beginnings of the Workshop

The idea of updating and strengthening Japan-U.S. collaboration in the field of digital sciences was officially discussed at the 12th U.S.-Japan Joint High-Level Committee Meeting on Science and Technology Cooperation held in Washington, DC in April 2013, which was attended by high-level policymakers for science, technology, and education from both countries. To promote grassroots and democratic participation, an open forum sponsored by the U.S. State Department and the Carnegie International Peace Foundation was held in conjunction with the meetings for discussion among universities, think tanks, and private sector representatives. Follow-up sessions were held in Tokyo to further look into the possibilities and need for cooperation in the fields of big data, Internet of things (IoT), AI, cybersecurity, robotics, and quantum information science. At these meetings, the importance of creating a hub for collaboration among U.S. and Japanese industry and academia in advancing science and technology for the digital era was confirmed.

Digital Innovation Hub Workshops

These high-level discussions were important to promote awareness and interest in Japan-U.S. collaboration at the government level. However, to bring the idea to fruition, the next step was to develop a platform for discussion among academics and university representatives. The first Japan-U.S. Digital Innovation Hub Workshop was held in Washington, DC in 2015 with participation from academia (four Japanese and three U.S. universities) and private companies, and with the strong encouragement and backing of Shuzaburo Takeda,¹ the Embassy of Japan in the U.S., and funding agencies from both countries.² During the two days of the workshop, participants exchanged opinions on industry-academia-government collaboration. While the first part of the meeting was opened to the public, the second half was a closed session for researchers and university executives to discuss and consider the importance of inter-university exchange and collaboration in the global and digital era. Concrete discussions on joint research, promotion of faculty exchange, and joint education initiatives were conducted. The second and third workshops were also held in Washington, DC in

1 Shuzaburo Takeda, president, Takeda and Associates, and at the time, senior advisor to MEXT.

2 Participants from Japan included Tohoku University, Nagoya University, Osaka University, Keio University, Riken, Japan Science and Technology Agency (JST), New Energy and Industrial Technology Development Organization (NEDO), Ministry of Economy, Trade and Industry (METI), Ministry of Education, Culture, Sports, Science and Technology (MEXT), Nissan, Hitachi. Participants from the U.S. included George Washington University, University of Maryland, Washington University in St. Louis, Accenture, IBM, and Amazon.

2016 and 2017, respectively. From the fourth event, the workshops have been held alternately in Japan and the United States as shown in the following table.

	Date	Venue, Place	Participants
Fourth Workshop	March 19-20, 2018	University of Tsukuba, Tsukuba, Japan	Co-organizers: JST, NEDO Secretariat: University of Tsukuba Eight Japanese universities Eight U.S. universities Private companies
Fifth Workshop	June 28-29, 2018	Arizona State University in Washington, DC, Washington, DC	Secretariat: Arizona State University Seven Japanese universities Eleven U.S. universities
Sixth Workshop	June 10, 2019	University of Tsukuba, Tsukuba, Japan	Co-organizers: JST, NEDO Secretariat: University of Tsukuba Nine Japanese universities Nine U.S. universities Private companies

At the sixth Digital Innovation Hub Workshop, the regional scope of collaboration was expanded to include delegates from the Indian Institute of Technology Bombay, as well as expansion of the number of participants from Japan and the U.S. Discussions focused on promoting industry-academia collaboration in the areas of cybersecurity, cyber-trust, and data governability for realizing the new digital age of Society 5.0, which is the Japanese government’s vision for a “human-centered society that balances economic advancement with the resolution of social problems by a system that highly integrates cyberspace and physical space.”³ The need to establish rules for academic and economic security based on the core values of reciprocity, accountability and transparency was affirmed.

Future Path of the U.S.-Japan Digital Innovation Hub Workshops

The six workshops that have been conducted to date have not only built common awareness and mutual understanding among the participating Japanese and U.S. universities, but also have begun to lead to concrete collaborations. It seems the top-down indications of priorities are incentivizing bottom-up research proposals and activities. Over the years, joint funding from both governments has promoted enduring relationships

3 Japanese Cabinet Office: https://www8.cao.go.jp/cstp/english/society5_0/index.html

between research institutions in Japan and the United States. For example, many of the partner universities have formed joint research initiatives with funding from the Japanese New Energy and Industrial Technology Development Organization's (NEDO) "Realization of Smart Society by Applying Artificial Intelligence Technologies" funding scheme.

The following is a list of such multiyear projects by focus area and consortium member institutions:

1. Project on mobility/natural language understanding
 - Partners Universities: Nagoya University, The Ohio State University, University of Texas at Dallas, Johns Hopkins University
 - This project focuses on explainable AI, which describes the judgment basis of AI in natural languages, to encourage human understanding of and confidence in AI. The aim is to contribute to consumer confidence in autonomous driving by making the action decisions made by AI more easily understandable.
2. Project on health care and machine-human interaction
 - Partners Universities: Hiroshima University, Arizona State University
 - This project focusses on how AI can be used for sustaining motivation for physical training for lifelong maintenance of physical strength and health. The goal is to develop AI-based coaching and self-care system using wearable sensing and personal information collection gear.
3. Project on medical care and machine learning
 - Partners Universities: Tohoku University, Case Western Reserve University, Johns Hopkins University
 - One of major issues in identifying antibodies for fighting infections is the time and cost involved in the process. This project investigates the use of machine learning technologies, bioinformatics, and computational chemistry to develop new antibodies with shorter development time and less cost.
4. Project on collaborative data analysis and machine learning modeling
 - Partners Universities: University of Tsukuba, University of Delaware, Johns Hopkins University, Purdue University, The Ohio State University
 - Obtaining data for machine learning is becoming increasingly difficult due to growing concern for protection of privacy and personal information. This project is developing a new platform technology that enables data sharing and collaborative analysis by using intermediate data expression, or data without personal or sensitive information. University of Tsukuba's main area of focus will be on machine learning; University of Delaware, security; John Hopkins, medical data analysis; and Ohio State, smart cities.

In addition, in July 2019, the National Science Foundation (NSF) and Japan Science and Technology Agency (JST) launched the JST-NSF Research Grant for "Smart and Connected Communities,"⁴ to support research in smart and connected community solutions. The call for application stated specific interests in "disaster response and emergency management, precision agriculture, cybersecurity of the electric grid and Internet-of-Things (IoT) devices, and wired and wireless networking."

4 https://nsf.gov/news/news_summ.jsp?cntn_id=298806

The seventh Digital Innovation Hub Workshop, organized by The Ohio State University and the University of Tsukuba, could not occur as planned in 2020 due to the global coronavirus pandemic. Nonetheless, plans are moving forward to host a virtual workshop in the near future. One organizing theme proposed is Smart Mobility, a project that has been prioritized by Ohio State's College of Engineering and the Office of Research. The project's goal is to use emerging sensing, computational, and communications technologies to solve transportation problems across all modes. This new initiative incorporates education at the undergraduate and graduate levels, research, innovation, economic development, and community development. The initiative includes research in traditional areas such as transportation and automotive research as well as including data analytics, artificial intelligence and machine learning, sustainability, energy, urban planning, smart infrastructure, human behavior and human factors, cybersecurity, materials, manufacturing, connected and automated vehicles, human health, and other areas.⁵

Overall, researchers within the Digital Innovation Hub hope to continue to solidify the U.S.-Japan platform guided by a shared vision and values to facilitate the exchange of researchers in important areas of digital science such as AI, big data, and cybersecurity. The aim is to deploy the discoveries for practical societal use by joining forces with U.S. and Japanese industry and the support of both governments.



Photo courtesy of: Arizona State University, 2018.

5 Chris Atkinson, professor of mechanical and aerospace engineering and director, Smart Mobility, The Ohio State University, communication with authors, August 23, 2020.