

# Open Innovation AI Science Research and Development Promotion Center

Director General Yutaka Kidawara

As a center for the promotion of efforts to create open innovation in the field of artificial intelligence (AI), as mentioned in the NICT's 4th Medium- to Long-Term Plan, and to implement the government's plan for economic growth based on the R&D and commercialization of AI technology, we need a central organization that can promote external links. Based on these trends, the AI Science Research and Development Promotion Center (AIS) was founded in April 2017. Since then, we have also been working to promote the development of systems and raise awareness (including the creation of an AIS logo and PR activities via the NICT public relations magazine).

At AIS, we aim to set up an R&D environment that is accessible to industry, academia, and government for the use of data collected by NICT, and to provide a one-stop service with a view to social implementation (Fig.1).



Fig.1 : Logo of the AI Science Research and Development Promotion Center (AIS)

cluding a large-scale storage system for AI data, and a GPGPU processing server for large-scale machine learning.

### Maintaining AI-related data

In addition to organizing basic ideas for the sharing of data with third parties and rules for the use of data (Fig.2), we are also compiling lists of AI data and related applications that are available for sharing (language resources,

Our priority R&D tasks for FY2017 are as follows:

- Constructing an AI data testbed

We have started building an advanced AI testbed that allows various forms of AI data collected in NICT's previous R&D efforts to be used on a nationwide scale via the Japan Gigabit Network (JGN) in order to accelerate the pace of AI-related R&D and demonstration trials.

- Promoting open innovation research projects

We are promoting open innovation research projects by strengthening our AI-related research ties with industry, academia, and government agencies.

Here are the main topics of activities at AIS:

### Constructing and maintaining an AI data testbed

Our AI data testbed is a platform aimed at the development of new AI technology and innovative creations based on this technology by applying and verifying the latest machine learning technology and the like to various forms of data collected and stored during previous R&D work at NICT. In FY2017, in collaboration with the ICT Testbed Research and Development Promotion Center, we set up systems in-

<p>• <b>Prohibited uses</b></p> <p>(a) Uses that contravene any laws, regulations or ordinances, or are contrary to public order and morals</p> <p>(b) Uses that pose a threat to national security, or the security of individual citizens</p> <p>(c) Uses that place undue load on the Web server</p> <p>• <b>Warning re infringement of third party rights</b></p> <p>When data is covered by copyrights and other rights of third parties other than NICT, it is the user's responsibility to ensure that these third parties have given their permission for use of the data unless it is clear that these rights have already been processed.</p> <p>Also, content acquired by, for example, cooperating with the APIs of external databases or the like should be handled according to the provider's terms of use.</p> <p>• <b>Disclaimers</b></p> <p>Disclaimers regarding all acts performed using the data (including the use of information such as editing or processing data), Public data not guaranteed to be</p>	<p>complete, accurate, comprehensive or fit for any particular purpose, Data liable to be changed, moved, deleted etc. without prior notice.</p> <p>• <b>Source description</b></p> <p>State the source when using data, and include additional notes to show when the data has been edited, augmented, etc.</p> <p>• <b>Individual terms of use</b></p> <p>Parts of the data may be subject to additional individual constraints (fees, physical/organizational access limitations, corporate status of user, usage methods, etc.), which must be complied with when specified.</p> <p>• <b>Governing law and jurisdiction by agreement</b></p> <p>These rules of use are to be interpreted based on Japanese law. The use of data according to these rules and any disputes concerning these rules shall be dealt with in the first instance by the exclusive jurisdiction of the Tokyo District Court.</p> <p>• <b>Other considerations</b></p>
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Fig.2 : Overview of the AI data sharing rules

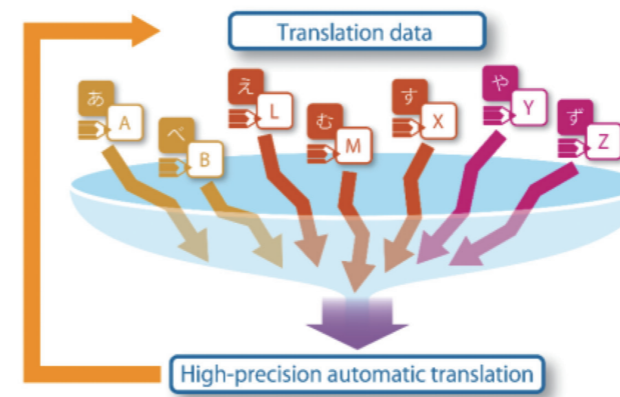


Fig.3 : Our translation bank concept (Hon'yaku Bank)

voice resources, bio-related data, brain-related data) and publishing them on the AIS website. We have also conducted a wide range of surveys for user evaluation in NICT and to extract very scarce data.

### Neural big data infrastructure

In the neural big data infrastructure project, we are collaborating with the Center for Information and Neural Networks to prepare an R&D system where the large-scale collection of fMRI/MEG brain activity data and AI technology such as machine learning are used to implement next-generation AI systems for the analysis and simulation of brain activity, including brain biomarkers (Fig.4), brain information decoding, an electroencephalogram testbed, and brain & sports/wellness.

### Accelerating the study of neural translation dedicated to patent documentation

By entering into an agreement with the National Institute of Advanced Industrial Science and Technology on promoting collaboration and cooperation in the information communication field, we have started a joint study based on this agreement on the subject of neural machine translation dedicated to patent translation and a system structure that makes this possible. We conducted research on the use of multiple GPUs to perform parallel acceleration of neural machine translation training, and achieved speeds approximately four times faster than were possible with a single GPU.

### Operating a translation bank

At NICT, we are researching and developing neural machine translation as part of a

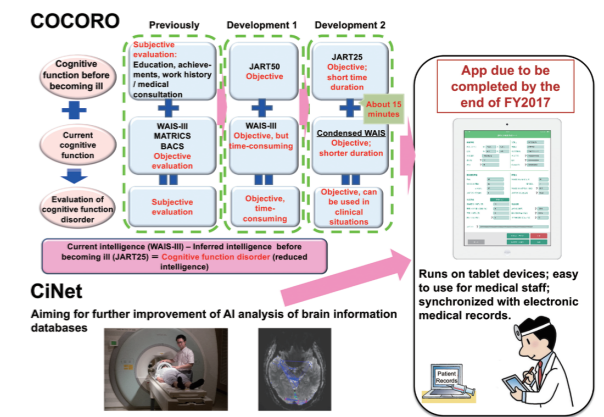


Fig.4 : Development of software for measuring cognitive function with a shorter test

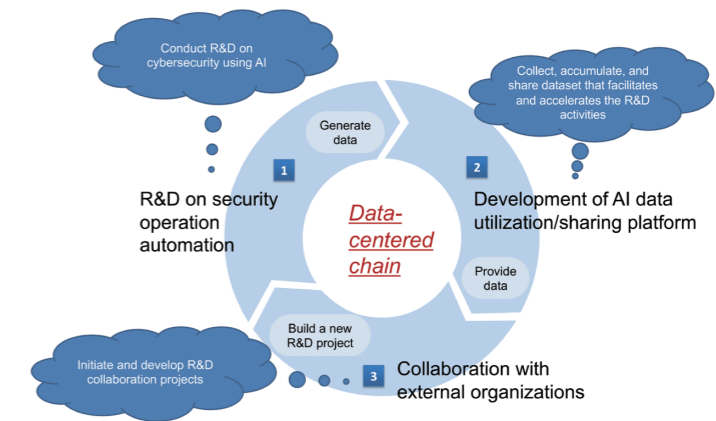


Fig.5 : Overview of AIS cybersecurity project

Global Communication Plan aimed at providing society with multilingual speech translation technology by 2020. Improvements to the algorithms of neural networks can be an effective way of improving the accuracy of neural machine translation, but it is vitally important to securing large quantities of translation data from various fields.

For this reason, in September 2017, we started operating a nationwide translation bank system (Hon'yaku Bank) to collect translation data in collaboration with the Ministry of Internal Affairs and Communications. We launched a website to raise awareness and improve people's understanding of this service, and in order to offer some merit for providing this system with translation data, we prepared a system whereby, when calculating the user license fees for NICT's machine translation technology, the charges are reduced in consideration of the estimated amount of translation data provided by a user. In the future, it is expected that Japan's translation technology will become more accurate and cover a wider range of fields due to the use of translation data collected by NICT via this translation bank (Fig.3).

During the period of roughly six months following the launch of the translation bank, over 50 companies have signed up to participate in the project.

### AI x security

In recent years, cyberattacks have posed new threats due to the accelerated use of AI and automation based on machine learning and the like, and there is an urgent need for more automation and AI in the security operations that deal with these attacks. For this reason, we launched the AI x security project in cooperation with the Cybersecurity Research Institute, and in FY2017 we identified specific tasks and built a research and development system (Fig.5).

### Participating in discussions on AI-related policy proposals, etc.

We are cooperating with external organizations by taking part in discussions of AI-related policy proposals at COCN (Council on Competitiveness-Nippon) and DiTT (Digital Textbook and Teaching), among others.