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# PRESS RELEASE

## Search Tokyo Tech STAR!

**Tokyo, June 13, 2011:** Tokyo Institute of Technology (Tokyo Tech) unveiled the "STAR Search", a one-site search system of its research and researchers.

### Points:

- Development of a researcher search system called "STAR Search" for easy and accurate search of information on Tokyo Tech education and research
- Interconnected search engine with one-stop access to information such as researchers' profiles, academic achievements, and educational activities, with the function to comprehensively distinguish and broadly present researchers.
- A common interface, which connects various campus systems that provide different information, that allows for one crossover search and display of search results
- The possibility to go beyond a simple web search and toward a comprehensive search that finds and correlates information succinctly.

### Outline:

Tokyo Tech has developed a pioneering search system called "[STAR Search](#)" that enables university and community members to search, organize, and integrate a wide range of information regarding Tokyo Tech's full-time researchers. The STAR Search engine was launched on May 30.

With the aim of making a societal contribution, Tokyo Tech developed "Tokyo Tech STAR Plan<sup>1</sup>" in which the University aims to proactively disclose academic information on its education and research accomplishments. The University developed two systems: the research repository<sup>2</sup> with search

capability to retrieve stored information on researchers' works, papers, and patents; and a lecture database system in which faculty voluntarily provide lecture materials for public disclosure. The comparatively large number of hits to these sites reveals Tokyo Tech's rich and sought-after content.

The STAR Search is a search engine which provides correlated information through a single search with its intricate interface system that connects various online databases. It enables users to easily find researchers by correlating information, learn about Tokyo Tech's education and research, and obtain information on the "stars" (highly acclaimed researchers) responsible for Tokyo Tech research. STAR Search aspires to promote research collaborations on and off campus and between university and industry to contribute to future research and educational development in society.

### **Background:**

With an unparalleled pioneering spirit Tokyo Tech has been proactively disseminating academic information to university and community members in various capacities, including through its primary search systems. The "Tokyo Tech Research Repository ([T2R2](#))," which holds researchers' works, papers and patents, generates accurate results owing to its strong search and output functions. The "Tokyo Tech Open Course Ware ([Tokyo Tech OCW](#)<sup>3</sup>)" organizes, stores and releases Tokyo Tech's ongoing lecture information and materials.

T2R2 is an academic repository system exclusively developed by Tokyo Tech, where researchers can easily submit their own research achievements. T2R2 was introduced in August 2008, and is unique in its utilization of stored information from various applications. At the end of April 2011, T2R2 stored and published 183,127 academic files and 5,993 patent-related materials. More than 140 universities and research institutions in Japan have research repositories; yet, the number of [holdings at Tokyo Tech](#) overwhelmingly exceeds any other similar database.

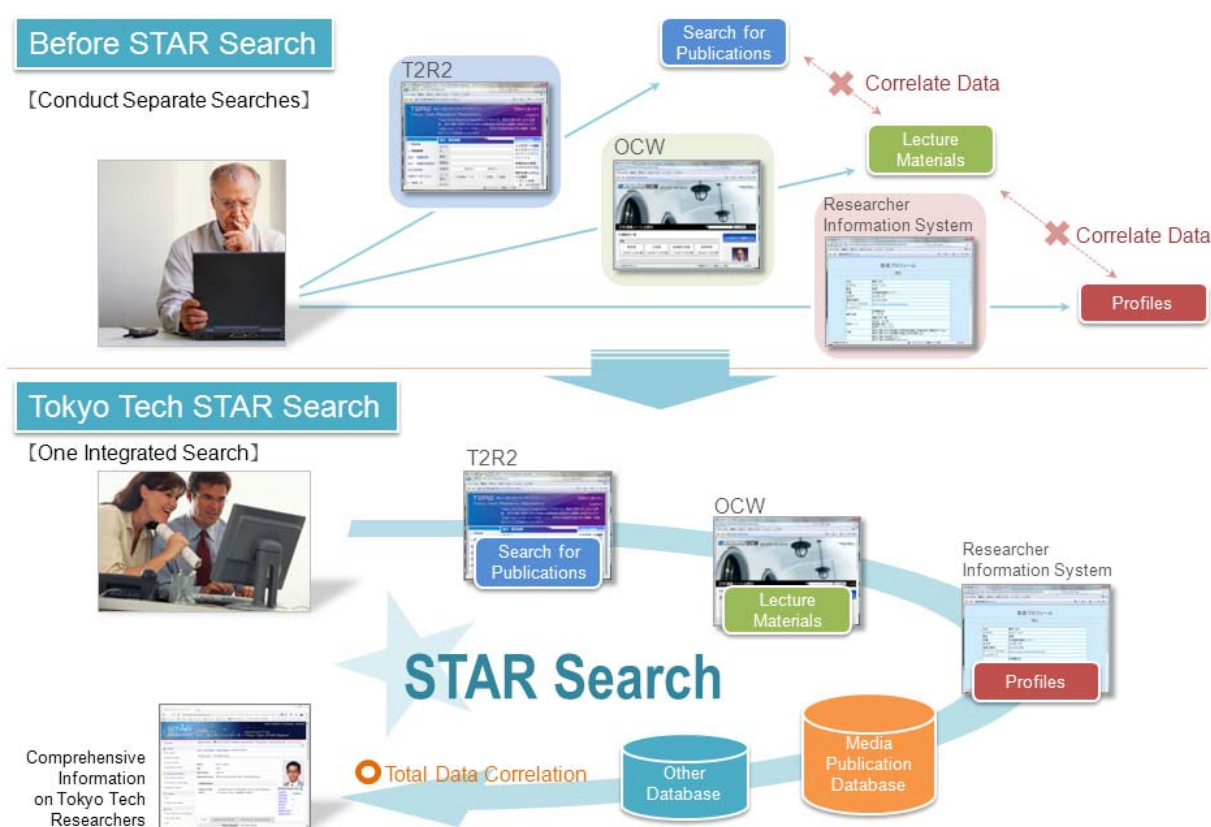
Tokyo Tech OCW is also a uniquely designed system through which faculty members publish their lecture information. As of the end of April 2011 Tokyo Tech OCW released 914 lecture materials, far surpassing other universities' OCW publication output. The "Tokyo Tech STAR Plan" builds upon the concept of systematically storing and disseminating resources that are the direct outcomes of educational and research activities.

Until STAR search was created, users seeking information about Tokyo Tech research had to access various sources to obtain a full picture. Different information was provided by the different systems and it was difficult to readily correlate the desired information. For instance, when seeking a researcher belonging to a certain academic society via a keyword search, users had to consult the OCW for lecture materials to determine the name of a particular researcher then backtrack and consult the T2R2 for the author of the paper related to the study or information about the academic society in order to retrieve

the faculty's name and information about his academic affiliations (Figure A). This type of cross-referencing was not unique to the Tokyo Tech system, but typical of other universities' search engines. It was not unusual for users to have come away not having been able to find a researcher through these searches.

Many people might choose search engines like Google when trying to retrieve information. Information stored on T2R2 and Tokyo Tech OCW can be found by such search engines. However, existing search systems only provide webpage links and cannot correlate information obtained by different sources.

Figure A



#### Details on the STAR Search development:

In order for a university to promote the dissemination of academic information, it is necessary to provide integrated and interrelated information. The STAR Search performs a crossover search of related databases of academic information such as T2R2 and Tokyo Tech OCW. In other words, the STAR Search system itself does not store data, but in response to a keyword search, the STAR Search collects information online from each system's search objective, correlates the data, and retrieves the compiled resources. Thus the original

data is maintained by each respective department. By dynamically retrieving data from the departments, the STAR Search makes data management easier, and provides as up-to-date information as possible.

This online interconnectivity of related systems was made possible by the development of dedicated Application Program Interface (API). Each system with its own search objective was developed by different developers based on different specifications; therefore, without the API the systems could not communicate with each other. A common API for each system was developed first, and the creation of not only the STAR Search itself but also of the individual units which communicate with each system were advanced. It took much hard work but once the common API was established, the interconnectivity of various campus systems could be achieved.

As the common API is expected to communicate with various systems and have scalability, a representational language called XML was selected for its high scalability. Additionally, Web functionality was adopted for the communication process. This approach known as Service-Oriented Architecture (SOA) was used for the first time to manage academic information of a university through STAR Search. The pre-existing staff ID-based authentication and authorization systems established at Tokyo Tech contributed to this successful design.

The STAR Search has four features: basic search; advanced search; keyword search; and organization search. For the basic, advanced and keyword searches, the matching search criteria within a related snippet<sup>4</sup> is highlighted along with the name of researcher whose data coincides with search criteria (Figure B). For the organization search, users can refine their search to include university specifics such as Master's programs, graduate schools or departments, to obtain a list of the researchers with their linked information. By clicking the researcher's name the comprehensive information of the researcher will be displayed (Figure C).

Figure B

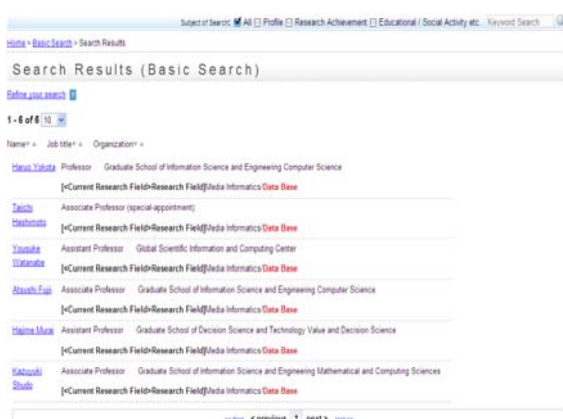
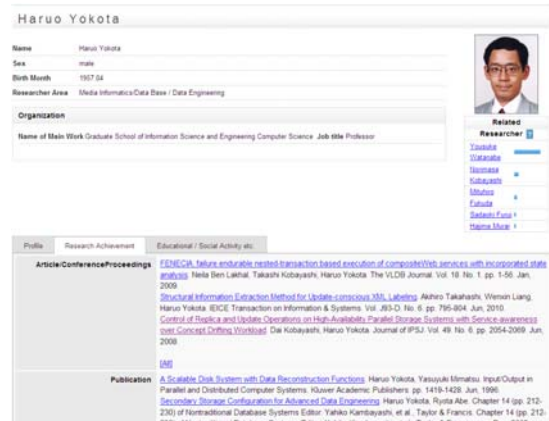


Figure C



The name, STAR Search, highlights the actualization of the Tokyo Tech STAR plan to develop key search functions, and, at the same time, the desire to assist in the search for "star" quality researchers at Tokyo

Tech. STAR Search aspires to promote research collaborations on and off campus and between university and industry to contribute to future research and educational development in society.

STAR Search: <http://search.star.titech.ac.jp/titech-ss/index.act?lang=en>

T2R2 [http://t2r2.star.titech.ac.jp/index\\_en.html](http://t2r2.star.titech.ac.jp/index_en.html)

Tokyo Tech OCW <http://www.ocw.titech.ac.jp/index.php?lang=EN>

Registry of Open Access Repositories [http://roar.eprints.org/cgi/roar\\_search/advanced?location\\_country=jp](http://roar.eprints.org/cgi/roar_search/advanced?location_country=jp)

## **Glossary:**

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### <sup>1</sup> Tokyo Tech STAR Plan

“Tokyo Tech” is the official shortened name of Tokyo Institute of Technology. The acronym “STAR” is derived from Science and Technology Academic Repository. The Tokyo Tech STAR Plan aims to systematically accumulate and disseminate various knowledge resources that are outcome of educational and research activities at Tokyo Tech.

### <sup>2</sup> Research Repository

A series of services a university provides to the members of its community in order to manage and disseminate digital materials created by the university and its members.

### <sup>3</sup> Open Course Ware

Activities to publish lectures and related information of higher education institutions for free via the Internet

### <sup>4</sup> Snippet

The information relevant to the searched terms is extracted from web pages and displayed briefly