

Office for Planning and Management



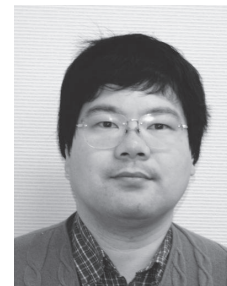
Shigeaki Tsunoyama
President



Kazuaki Yamauchi
Senior Associate Professor



Tsuyoshi Ishikawa
Senior Associate Professor



Junya Terazono
Associate Professor



Kyoko Okudaira
Associate Professor



Tsutomu Hashida
Associate Professor



Yasuhiro Abe
Associate Professor

Office for Planning and Management (OPM), headed by the University President, was established at the start of the University of Aizu as an internal research organization to carry out implementing the following assignments of the University:

- General investigative research concerning university functions
- Performing general program planning and design regarding university education and research
- International exchange
- Public relations and publications
- Legal affairs
- Local arrangement of international conference
- Other necessary matters concerning administrative management

As the University develops, the expectations for the OPM have been changing from time to time. After the corporatization, in 2008, dealing with the matters of special mission given by the regents of the University was added to its functions. However, collaborating with other organizations of the University for the advancement of its education and research always remain the most important mission of the OPM.

For education and coalition with high schools and junior high schools as well as local community, the OPM is planning and arranging "Science Cafe", a scientific talk session with small number of general citizens (20 to 30 persons in most cases). Additionally, collaboration with several high schools, especially ones which have SSH (Super Science High School) course, has been carried out. These activities can be good opportunities for the University to increase the name recognition.

In AY2013, two members, Junya Terazono and Yasuhiro Abe, newly at the retirement of Yuko Kesen at the end of AY2012.

Kazuaki Yamauchi is assigned to serve as Director-General of Department for Student Affairs. His main work is to recruit prospective students by visiting high schools all over Japan and attending career counseling meetings for high school students held in major cities in Japan. He visited more than 200 high schools in AY2013. He also involved in the management of entrance examinations and admissions of the university.

Tsutomu Hashida is mostly engaged in research of higher education policy including MEXT-funded projects and other tasks such as university evaluation and relations to the Japanese association of public universities (Kodaikyo). He gave a series of lectures on basic Japanese writing, too. The main work of Kyoko Okudaira was personnel matters of fresh hiring and education collaboration with high schools and junior high schools. She was also involved in JSPS research application. Junya Terazono, concurrent assignment with CAIST, worked for creating Annual Review and education linkage with high schools with Ms. Okudaira, and public affairs of the University using internet media such as Twitter and the website.

Yasuhiro Abe supports faculty to apply external grants, especially international collaboration programs of the Japan Society for the Promotion of Science. In AY2013, he was the member of the University 20th Anniversary Commemorative Events Secretarial Board. His main work was to coordinate

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the University 20th commemorative magazine. He was also a coordinator for the application of the Center of Innovation program of MEXT.

All members of OPM worked collaboratively and proactively for the realization of better University research and education.

Refereed Journal Papers

- [hashida-01:2013] Tsutomu Hashida. Towards the Development of Global Professionals in Japan (Is the Idea of “Global Human Resources” Really Global?). *Journal of the Japanese Association for Global Competence Education (JAGCE)*, 1(1):1 – 6, 1 2014.

Invited paper

- [terazono-01:2013] J. Terazono. The History of Japanese Lunar Exploration -From the Eyes of the Inside-. *Nagoya Journal of Philosophy*, 10:98–125, 2013.

The history of Japanese lunar exploration has not been well documented due to lack of systematic survey of formation process. In this paper, I describe the history of Japanese lunar exploration, particularly “Kaguya” (formerly called as “SELENE”), launched in 2007 and ended in 2009. The recording of such a recent lunar exploration history is important as the information on the mission is dissipated so quickly after dissolution of the project team. This paper suggests that this project was carefully initiated by two Japanese space agencies and was developed through gradual cooperation and coordination between two agencies. In this process, interaction of young engineers and researchers made the base of future joint project and finally a merger of the agencies.

In Japanese with English abstract.

- [terazono-02:2013] S. Kodama N. Yamamoto N. Hirata Y. Ogawa J. Terazono, R. Nakamura and H. Demura. WISE-CAPS: Browsing and Analysing System for Lunar and Planetary Data. *Journal of Space Science Informatics Japan*, (2):89–102, 2013.

More and more data is obtained through the lunar and planetary explorations worldwide. Due to overwhelming amount of data and its complex nature, the methodology of conventional desktop-based approach is becoming a tether. To solve this problem, network-oriented approach is appropriate solution for handling growing amount of data, and Web-GIS system is the best one to use for data browsing, sharing and analyzing online.

We are now creating a system called “WISE-CAPS” (Web-based Integrated Secure Environment for Collaborative Analysis of Planetary Science) in The University of Aizu to realize this ideal. The system is composed of three servers, web server, database server and new implementation test server with 12 Terrabytes disk in the backend to ensure large

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data storage. We use FOSS (Free Open Source Software) entirely in the system from the basic operating system to application software to utilize cutting-edge technology and to reduce system cost.

Currently, lunar data obtained by Clementine, American lunar explorer, is used for base map data, and several image data obtained by Kaguya, Japanese lunar explorer, are added as separated layers. Our system also has unique function of user control, limiting data access to authorized users or groups. This function enables flexible data publication with users' will, for limited users or groups. Recently, WISE-CAPS equipped several new capabilities. One of the new feature is data registration function from web browsers, without using separate data transfer software. Another new feature is integrated data display of LISM, Lunar Imager and Spectrometer onboard Kaguya, which can display three different kinds of data in one web browser page. These new capabilities are purely unique only in our WISE-CAPS.

In Japanese with English abstract. ISSN: 1349-1113

Unrefereed Papers

- [okudaira-01:2013] Taku ODASHIMA, Takeyuki MATSUMOTO, Yuichi YAGUCHI, Kyoko OKUDAIRA, Yusuke KIYONAGA, Satoshi SASAKI, Hajime YANO, Eiichi IMAI, Hirohide DEMURA, Akihiko YAMAGISHI, and Tanpopo WG. Image recognition of sample penetration tracks in aerogel for Tanpopo mission on the International Space Station. *Proceedings of the annual meeting of the Visualization Society of Japan, Aizu 2013*, 2013.
- [okudaira-02:2013] Naomi ONOSE Hajime YANO Makoto TABATA Kyoko OKUDAIRA, Sunao HASEGAWA and Hideyuki KAWAI. In situ observation of penetration track formation by solid microparticles in silica aerogel. *Proceedings of the annual meeting of the Visualization Society of Japan, Aizu 2013*, 2013.
- [okudaira-03:2013] Hajime Yano Hikaru Yabuta Makoto Tabata Shinichi Yokobori Eiichi Imai Kensei Kobayashi Hajime Mita Hideyuki Kawai Masumi Higashide Satoshi Sasaki Tanpopo WG Kyoko Okudaira, Akihiko Yamagishi. Preliminary examination plan and subsequent analytical procedure of captured samples by

aerogel in the Tanpopo mission. *Proceedings of Japan Geoscience Union Meeting 2013*, 2013.

Refereed Proceeding Papers

[hashida-02:2013] Tsutomu Hashida. Towards the Development of Global Professionals in Japan (Is the Idea of “Global Human Resources” Really Global?). In *Proceedings of invited lectures for the first conference of the Japan Association for Global Competency Education (JAGCE)*, pages 16 – 17, 10 2013.

Invited lecture (Research reports on global competency education)

[terazono-03:2013] N. Hirata J. Terazono and Y. Ogawa. WISE-CAPS: Overcoming Information Gathering Challenges in Lunar Surface Exploration. In Subhash Bhalla (Eds.) Aastha Madaan, Shinji Kikuchi, editor, *Databases in Networked Information Systems: 9th International Workshop, DNIS 2014, Aizu-Wakamatsu, Japan, March 24-26, 2014 Proceedings (LNCS 8381)*, pages 266–273, Aizu-Wakamatsu, Fukushima, Japan, March, 2014. DNIS 2014, Springer.

Time-domain Space Exploration, particularly Lunar and planetary exploration are facing exponentially increasing size the data and the information. To manage huge data and to help for producing scientific results, we focus attention on the possibility of introducing GIS and creating WISE-CAPS (Web-based Interactive Secure Environment for Collaborative Analysis of Planetary Data). WISE-CAPS is a collaborative research environment specially designed for lunar and planetary exploration domain. DOI: 10.1007/978-3-319-05693-7_17

[terazono-04:2013] J. Terazono H. Nakamura, S. Bhalla and W. Chu. Kaguya Moon Mission Data Repository: New Query Language Interface for Locating GIS Objects. In Subhash Bhalla (Eds.) Aastha Madaan, Shinji Kikuchi, editor, *Databases in Networked Information Systems: 9th International Workshop, DNIS 2014, Aizu-Wakamatsu, Japan, March 24-26, 2014 Proceedings (LNCS 8381)*, pages 232–255, Aizu-Wakamatsu, Fukushima, Japan, March, 2014. DNIS 2014, Springer.

The observation data gathered by a lunar probe “Kaguya”, is now being officially published by Japan Aerospace Exploration Agency (JAXA)

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through the web site. However, this web site does not have the lunar location and name based search function, thus we can not retrieve the data by location name or by feature type. Therefore, we developed the lunar feature/name based Kaguya data search system. In addition, this system can be used by the simple keyword input, making use of Kaguya data. However, at present, only a geometric image product “TCOrtho.MAP” is available among the 88 Kaguya products. We plan to store, adopt all remaining products in a similar way, but the importing operation is not completely automated yet. Also it is hard to say that this system is highly optimized for dealing with Kaguya data. Because the base of this system is another support system called the Moon Seeker, it is for a lunar feature searching. Since finish of the Kaguya mission, some processed data, such as 3D map, are still generated by Kaguya’s observation data. Hence we hope to continue the enrichment of this system for further promotion of these demands for Kaguya data. DOI: 10.1007/978-3-319-05693-7_15

Unrefereed Papers

[okudaira-04:2013] M. Higashide E. Imai H. Kawai K. Kobayashi H. Mita K. Okudaira S. Sasaki M. Tabata H. Yabuta Y. Yaguchi H. Yano S. Yokobori A. Yamagishi, H. Hashimoto and Tanpopo WG. Plans of preliminary examination and subsequent analyses of captured dust samples by silica aerogel in the Tanpopo mission. In *Proceedings of HAYABUSA 2013, Symposium of Solar System Materials*, 2013.

[terazono-05:2013] N. Hirata J. Terazono K. Okudaira C. Honda Y. Ogawa T. Asada, H. Demura and K. Kitazato. The Space Education at The University of Aizu. In *The 57th Joint Conference of Space Science and Technology*, Yonago, Tottori, October 2013. The Japan Society for Aeronautical and Space Sciences.

We conducted space education in The University of Aizu since mid-1990s and the education activity is now widening. This activity is very unique compared to size of the university and its specialization, despite IT-dedicated university. In this lecture, authors will talk about previous, current and future direction of space education in The University of Aizu, and tells the possibility of space education in other similar universities. In Japanese.

- [terazono-06:2013] R. Nakamura Y. Ogawa N. Yamamoto H. Demura J. Terazono, N. Hirata and S. Kodama. Current Situation of WISE-CAPS Development: Web-Based Browsing, Sharing and Analysis System of Lunar and Planetary Data. In *2013 General Meeting of Japan Geoscience Union*, Makuhari Messe, Chiba, May 2013. Japan Geoscience Union.

WISE-CAPS (Web-based Interactive Secure Environment for Collaborative Analysis of Planetary Science) is a platform based on Web-GIS to enable Secure, Interactive and communicative analysis for lunar and planetary science. This system, developing at The University of Aizu, started its creation since 2009 and the capability is growing year by year. Here we address most current situation of development and new implementation. In Japanese with English abstract.

- [terazono-07:2013] J. Saito and J. Terazono. Seeking for Resources in Space: Ground-based Research and Exploration. In *The 57th Joint Conference of Space Science and Technology*, Yonago, Tottori, October 2013. The Japan Society for Aeronautical and Space Sciences.

“Asteroid Mining”, the prospect of near-Earth asteroid, has been activated by several public companies mainly by US. This movement can be a big trend for future space development. However, we need to evaluate the value and method of such space mining based on previous research and explorations. Here we address consideration and suggestion for future asteroid mining based on past research (mainly of meteorites) and exploration (mainly of asteroids). In Japanese.

- [terazono-08:2013] J. Terazono and M. Onuki. The Resource Development of Asteroids: World's Current Trend. In *The 57th Joint Conference of Space Science and Technology*, Yonago, Tottori, October 2013. The Japan Society for Aeronautical and Space Sciences.

Since the launch of The Asteroid Initiative by NASA in 2013, there is a strong trend to aim asteroid mining. Already two companies, dedicated in asteroid mining, started the operation. Some space companies also aspires the asteroid mining or space resource detection. Here we show the most current situation of asteroid mining of the world (mainly US), and addresses future direction and favorable response of Japanese space society. In Japanese.

- [terazono-09:2013] N. Hirata T. Matsunaga S. Yamamoto Y. Ogawa Y. Yokota Y. Ishihara, R. Nakamura and J. Terazono. A Testbed

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of Web-Based Hyperspectral Data Analysis Platform. In *2013 General Meeting of Japan Geoscience Union*, Makuhari Messe, Chiba, May 2013. Japan Geoscience Union.

We are now developing web based hyperspectral data analysis platform for future satellite borne hyperspectral sensors. The system will have capability for searching, browsing and analyzing for hyperspectral and other kinds of data through the web browsers. The platform is based on Web-GIS with backend of InfoFrame DWH Appliance (IDA). We did not have global hyperspectral data for the Earth yet, but for the Moon, we already have hyperspectral data obtained by SELENE Spectral Profiler (SP). Then we use those SP data for building testbed system. The testbed system has capability for searching SP data by coordinate, spectral characteristics, geological settings based on other kind of lunar data. In this paper, we show the current status of the testbed system and future development plan of the system for lunar data and for Earth observation hyperspectral sensors. In Japanese with English Abstract.

[terazono-10:2013] T. Matsunaga R. Nakamura Y. Yokota S. Yamamoto M. Ohtake Y. Hayashi J. Haruyama Y. Hayashi, Y. Ogawa and J. Terazono. Development of new analysis tool for the data from Spectral Profiler onboard Kaguya/SELENE based on the Modified Gaussian Model(MGM). In *Proceedings of The 46th Lunar and Planetary Symposium*, Sagami-hara, Kanagawa, August 2013. ISAS/JAXA, JAXA.

The Spectral Profiler (SP) onboard Kaguya/SELENE, which is the Japanese lunar orbiter, observed the reflectance spectra of the Moon. SP is a near-visible infrared spectrometer covering the wavelength of 0.5-2.6 μ m. The observed SP spectra generally contain the mineral information such as olivine, pyroxene and plagioclase on the Moon. By de-convolutioning the observed SP spectra, we can retrieve the mineral information of the lunar surface and make a map of the mineral distribution. In the analysis of the visible-near infrared spectra of the Moon, the Modified Gaussian Model (MGM) is generally used. We can detect feature of the absorption band which is characteristic to each of the mineral by applying MGM to the SP data. However, MGM is difficult to be applied to a large amount of spectral data because the model only handles a single spectrum at a time. In addition, it is hard to follow the MGM results (the features of absorption bands) visually. In this study, we customized the MGM code so that we can apply it to

all SP data automatically and detect the feature of absorption bands parameter (central wavelength, full width at half maximum, strength) automatically. We also show some examples of the visualization of the MGM results.

- [yasu-abe-01:2013] J. Yamazaki Y. Abe H. Fukuhara T. Miyazaki J. Iwase Y. Ito, H. Tokura and T. Hayashi. A Novel Information Infrastructure for Massive and Real-time Data Processing. In *Proceedings of the 75th National Convention of IPSJ*, 2013.
- [yasu-abe-02:2013] J. Yamazaki Y. Abe H. Fukuhara T. Miyazaki Y. Yaguchi R. Oka J. Iwase M. Murasawa, H. Tokura and T. Hayashi. A Novel Network-centric Information Infrastructure for Dynamic Associations with Related Data. In *Proceedings of the 75th National Convention of IPSJ*, 2013.

Academic Activities

- [hashida-03:2013] Tsutomu Hashida, 9 2013.
Founding member of the Japan Association for Global Competency Education (JAGCE)
- [hashida-04:2013] Tsutomu Hashida, 3 2014.
Career Design Institute - Japan, The 55th Conference "Career Advancement of Developers in Game Industry: A view from Work, Life and Study", To be printed in "Career Design Newsletter" No. 115 (Apr, 2014) published by CDIJ.
- [terazono-11:2013] J. Terazono, October 2013.
Organizing Committee of The 57th Joint Conference of Space Science and Technology
- [terazono-12:2013] J. Terazono, April 2013.
Program Committee, International Symposium on Space Technology and Science
- [terazono-13:2013] J. Terazono, April 2013.
Committee member of the Space Utilization Committee, JSASS (the 46th period)

Ph.D and Others Theses

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- [terazono-14:2013] Sari Yamaguchi. Graduation Thesis: Creating a New Game Based on Dynamic Vision Using Java, University of Aizu, 2014.
Thesis Advisor: Anh T. Pham
- [terazono-15:2013] Shuhei Sato. Graduation Thesis: Improvement of SEIMS: Space Event Information Management System, University of Aizu, 2014.
Thesis Advisor: J. Terazono
- [terazono-16:2013] Takeshi Mir. Graduation Thesis: A New Mailbox System Implementation with Database Technology, University of Aizu, 2014.
Thesis Advisor: J. Terazono
- [terazono-17:2013] Mina Namiki. Graduation Thesis: Development of a Web-accessible database of Intensive English Programs in the US, University of Aizu, 2014.
Thesis Advisor: W. Rozycki
- [terazono-18:2013] Keisuke Kimura. Graduation Thesis: A New Approach of User Experience for Interactive Web Pages Using HTML5, University of Aizu, 2014.
Thesis Advisor: J. Terazono
- [terazono-19:2013] Hiroki Nakamura. Master Thesis: Kaguya Moon Mission Data Repository Interface for Locating GIS objects within Web Queries, University of Aizu, 2014.
Thesis Advisor: S. Bhalla
- [terazono-20:2013] Shohei Kuwano. Graduation Thesis: Single-Sign-On Mechanism Using LDAP and OpenAM for GIS Authentication, University of Aizu, 2014.
Thesis Advisor: J. Terazono