



**ICCO 2019**  
**TOKYO**

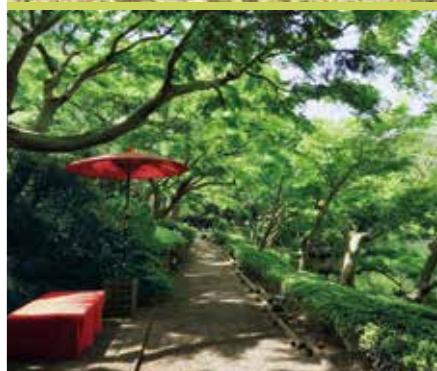
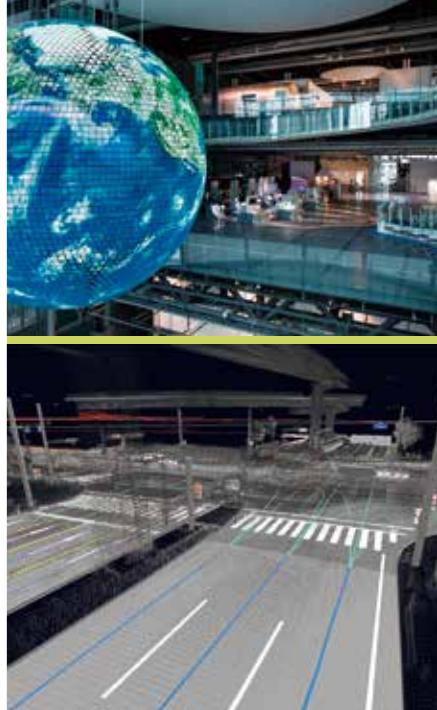
*Mapping Everything for Everyone*

29th

# International Cartographic Conference

15th-20th July 2019

Program



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# Local Organizing Committee

## President

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## Chair of the Venue & Exhibitions

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## Chair of the Events & Excursions

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## Chair of the Commission Meeting

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Hiroyuki Endo (Next Publishing Inc.)

Yoichi Eto (Ministry of Land, Infrastructure, Transport and Tourism)

Taichi Furuhashi (Aoyama Gakuin University)

Seia Hisai (Japan Map Center)

Toyoaki Kawai (Shinagawa Joshi Gakuin)

Taketo Kobayashi (Chiba Prefectural Chiba Senior High School)

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Toshikazu Seto (The University of Tokyo)

Nonoko Tsukada (Tokyo Map Research Inc.)

Masaharu Tsuzawa (Association of Precise Survey and Applied Technology)

Taro Ubukawa (Geospatial Information Authority of Japan) Hidetoshi Ueda (Japan Hydrographic Association)

Hiroshi Une (Japan Cartographers Association)

Katsuhiko Urabe (Nihon University)

# Sponsor List

(in alphabetical order)

## GLOBAL



## HEMISPHERE



## CONTINENTAL



## INTERNATIONAL TECHNICAL-COMMERCIAL EXHIBITION

- AERO ASAHI CORPORATION
- ASAHI ETIC CO., LTD.
- Center for Spatial Information Science,  
the University of Tokyo & Tokyo Digital Archives Project
- CHINA MAP CULTURAL AND CREATIVE INDUSTRY  
ALLIANCE
- EAST VIEW GEOSPATIAL
- Esri
- Esri Japan Corporation
- Hokkaido-Chizu Co., Ltd.
- KIMOTO CO., LTD.
- Laboratory for Cartographic Literacy
- Ministry of Internal Affairs and Communication
- ORBITAL NET INC.
- Pacific Spatial Solutions, Inc. / Avenza Systems Inc.
- PASCO CORPORATION
- Remote Sensing Technology Center of Japan
- SuperMap Japan CO., Ltd.
- TEIKOKU - SHOIN
- The Korean Cartographic Association
- TOKYO GEOGRAPHICAL SOCIETY

## ADVERTISEMENT IN CONFERENCE PRODUCTS

- Georepublic Japan
- MIERUNE Inc.
- Nippon Sogo Systems, Inc.
- Taylor & Francis Asia Pacific

## SUPPORTED BY

- The Association of Japanese Geographers
- GIS Association of Japan
- Geospatial Information Authority of Japan
- The Human Geographical Society of Japan
- Japan Aerospace Exploration Agency
- Japan Cartographers Association
- Japan Coast Guard
- Japan Organization of Geographical Sciences
- Tokyo Geographical Society
- Tokyo Metropolitan Government

# Conference Themes

Venue
Miraikan
Plaza Heisei
Integrated/Cancelled

- T01** Art and Cartography
- T02** Atlases
- T03** Cartographic Heritage into the Digital
- T04** Cartography and Children
- T05** Cartography in Early Warning and Crisis Management
- T06** Cognitive Issues in Geographic Information Visualization
- T07** Education and Training
- T08** Generalisation and Multiple Representation
- T09** Geospatial Analysis and Modeling
- T10** GI for Sustainability
- T11** History of Cartography
- T12** Location Based Services
- T13** Map Design
- T14** Map Production and Geoinformation Management
- T15** Map Projections
- T16** Maps and Graphics for Blind and Partially Sighted People
- T17** Maps and the Internet
- T18** Mountain Cartography
- T19** Open Source Geospatial Technologies
- T20** Planetary Cartography
- T21** SDI and Standards
- T22** Sensor-driven Mapping
- T23** Topographic Mapping
- T24** Toponymy
- T25** Ubiquitous Mapping, Spatial DB and IoT-Based Systems
- T26** Use, User and Usability Issues
- T27** Visual Analytics
- T28** Marine Cartography
- T29** Digital Humanities and GIS
- T30** GIS, Remote Sensing and Cartographic Theory, Methodology and Applications
- T31** Visualization and Analysis of Geographical Process
- T32** Mapping Cities
- T33** Design and visual variables: Rethinking Jacques Bertin
- T34** Geo for All: Open source GIS education
- T35** Crowdsourced Geospatial Information
- T36** Transition to Modern and Contemporary Mappings
- T37** Maps for SDGs
- T38** Mapping the Environment
- T39** Theoretical Cartography
- T40** AI, Robotics, Autonomous Cars and Mapping
- T41** Maps and Games
- T42** Big Data and Data Science
- T43** Others
- Asia** Asia GIS

# Keynote Presentations



## Venkatesh Raghavan

**Professor of Geoinformatics, Osaka City University, Japan**

- **TUE 16 JUL**
- **13:30-14:30**
- **International Conference Hall, Plaza Heisei**

### BIOGRAPHY

Prof. Venkatesh Raghavan is an alumnus of the Department of Geology, Pune University and obtained his Doctor of Science in Geological Remote Sensing from Osaka City University Japan in 1994. He is presently based in Japan as Professor of Geoinformatics at the Graduate School of Engineering, Osaka City University. His research interest includes geospatial Web Services, sensor network, Geo-Crowd Sourcing and remote sensing for change detection. Prof. Venkatesh Raghavan was one of the founders of the Free and Open Source Software for Geoinformatics (FOSS4G) global initiative in 2004. He has been involved in OSGeo Foundation ([www.osgeo.org](http://www.osgeo.org)) since its inception in 2006. He was on the first OSGeo Board and was re-elected to again in 2015 and served as the President of the Foundation during 2016-2017. He is on the Advisory Board of the Geo4All initiative ([www.geo4all.org](http://www.geo4all.org)). He plays active role in promoting FOSS4G in Asia.

Prof. Raghavan is currently Co-Editor-in-Chief of Spatial Information Research and is on the Editorial Board of International Journal of Geoinformatics and Applied Geomatics journals. He is the founder of ZOO WPS Platform Project which offers a comprehensive framework for deploying Geospatial-Software as a Service (Geo-SaaS). He is a team leader and member in several Geoinformatics projects and has vast experience in conducting national and international training programs and development of learning materials for RS/GIS using FOSS4G. He is actively involved in promoting Free and Open Source Software Solutions for Geoinformatics (FOSS4G) worldwide including organizing global, regional and national FOSS4G events.

He was awarded the Mining & Material Processing Institute of Japan Young Scientist Award in 1995. He has taken up visiting professor assignments at prestigious universities such as the Asian Institute of Technology, Bangkok and China University of Mining and Technology, Beijing. Prof. Venkatesh Raghavan was recipient of the 2012 Sol Katz Award for his contribution to the Open Geospatial Community and remains to be only Asian to receive this honour till date.

### Beyond the Jargon: FOSS4G, OSGeo, Geo4All and ME4E

Geo-enabled Information and Communication Technology (Geo-ICT) is the mainstay of several international and national initiatives. Geo-ICT research contributes to the development of various location-aware services using Global Positioning Systems (GPS), the Internet of Things (IoT), Sensor Networks (weather, environment, water/air pollution etc), and Remote Sensing (satellites, UAV's). Applied Geoinformatics, using tools such as Geographic Information System (GIS) and Remote Sensing, supports an increasingly wide range of disciplines that include the arts, humanities, social/natural sciences and engineering.

Open Source Software, Open Hardware, Open Data and Open Standards constitute the four vital pillars supporting the implementation and deployment of interoperable and scalable Geo-ICT solutions for a variety of applications areas. A robust and customizable platform to facilitate Geospatial-Software as a Service (Geo-SaaS) forms the backbone of several citizen centric initiatives. Prudent and effective use of geospatial technologies requires the fostering of a highly skilled workforce for developing, maintaining Geo-ICT solutions for societal needsThe FOSS4G (Free and Open Source Solutions for Geoinformatics) initiative that began in 2004, has gained widespread acceptance the world over the 15 years. Since 2006, the Open Source Geospatial Foundation (OSGeo) has been spearheading the collaborative development of open source geospatial software and promote its widespread use. Active OSGeo Chapters have also been established worldwide to cater to specific local needs. As a part of the educational outreach and skill development, the OSGeo Foundation along with partner organizations such as the International Cartographic Association and the International Society for Photogrammetry and Remote Sensing has also established the Geo4All international network of universities and research institutions offering high-level training and sharing of knowledge and experiences to build a strong and vibrant geospatial workforce.

Further, in recent years, a wealth of geospatial Open Data has become available through international and national agencies but also through participatory data production initiatives such as the Open Street Map. Due to the proliferation of GPS-enabled devices, Crowd Sourcing and Volunteered Geographic Information has also facilitated easy gathering and value addition of open geospatial data. The past decade has also seen the maturity of international standards for geospatial data exchanges and interoperability though the initiatives of the Open Geospatial Consortium (OGC) and ISO.

This talk aims at demystifying the acronyms FOSS4G, OSGeo and Geo4all through temporal focus on the past, present and future. The speaker plans to narrate some anecdotes and personal experiences as experiential traveller the FOSS4G world. A gist of some new initiatives being undertaken and priorities for coming years will be outlined. Lastly, opportunities for joint industry-academia-government initiatives for collaborative innovation in mapping and cartography will be discussed. Some examples of leveraging the Free & Open geospatial ecosystem for deploying a participatory mapping framework to bring about positive social change will also be presented.



## Steve Coast

**Vice president, TomTom**

- **WED 17 JUL**
- **13:30-14:30**
- **International Conference Hall, Plaza Heisei**

### BIOGRAPHY

Coast interned at Wolfram Research before studying computing science at University College London (UCL).

In July 2004, he founded the OpenStreetMap project (OSM).

Coast set up Z.X.V. Ltd. with Nick Black, Tom Carden and Ben Gimpert as a technology consultancy in 2005. In 2008 this became CloudMade after investment by Nikolaj Nyholm and Sunstone Capital (company's website claims it was established in 2007). He resigned from CloudMade in October 2010, although he remained a shareholder.[citation needed]

On 23 November 2010, Coast announced that he had accepted a position as Principal Architect at Microsoft's Bing Mobile.

On 3 September 2013, Coast wrote on his blog that he had started to work for TeleNav, taking care of OSM development for the company's Scout navigator.

In March 2014, Coast became an advisor to Auth0, an identity-as-a-service provider.

In November 2015, Coast published "The Book of OSM". The book contains 15 interviews conducted by Coast with various users who had participated in the project since its beginning.

In January 2016, he stepped down from full-time work at TeleNav and started his work as a board advisor in Navmii. In March 2016 he started working as Chief Evangelist for what3words. In May 2016 he became an advisor in MapJam. In fall 2017, he joined DigitalGlobe. In spring 2019 he joined TomTom as a vice president in the Maps department.

### The Past, Present, and Future of OpenStreetMap

Steve will be presenting on the past, present and future of OpenStreetMap – discussing how to edit, licensing, community and more. Steve will also discuss his book, "The Book of OSM", containing interviews with 15 early adopters of OSM to capture the early growth and feeling of the project.

# Keynote Presentations

## Ayako Kagawa

**Geographic Information Officer, Chief Cartographic Unit, Geospatial Information Section,  
Office of Information and Communications Technology, United Nations**

- THU 18 JUL
- 13:30-14:30
- International Conference Hall, Plaza Heisei

### BIOGRAPHY

The United Nations Geospatial Information Section is an office responsible in providing strategic and tactical geospatial information management services to the United Nations Secretariat. The Section provides wide range of services including maps and guidance for UN official publications and customised geospatial services for the Secretariat; serves as the Secretariat function of the United Nations Committee of Experts on Global Geospatial Information Management (UN-GGIM); provides technical support on international boundary issues including administrative boundaries; and provides programme management support to United Nations field missions who have geospatial support components. The Section provides technology driven solutions to enable Secretariat colleagues who are entrusted by the international community to resolve challenging global mandates and missions.

Ayako Kagawa is a Chartered Geographer, serving the United Nations since 2003 in various capacity including thematic mapping for the United Nations Office on Drugs and Crime (UNODC), topographic mapping for the peacekeepers in the United Nations Disengagement Observation Force (UNDOF) and currently with the United Nations Geospatial Information Section. She provides policy guidance and operational support in the areas of cartography, geospatial information management, international boundaries and geographical names. Prior to the United Nations, Ayako has worked with Japan Map Center as a Planning Officer in Japan and as a research assistant and a lecturer in ITC (Faculty of Geo-Information Science and Earth Observation, University of Twente) in The Netherlands.

### The Role of Cartographers in a Sustainable Development World

The 2030 Agenda for Sustainable Development or also known as the Sustainable Development Goals (SDGs) is the new global paradigm and blueprint to achieve a better and more sustainable future for all. To collectively achieve the SDGs, the global community agreed on 17 Goals as a baseline framework to measure and monitor its growth. How to measure and monitor development progress by countries has been a long-standing debate since the era of Millennium Development Goals (MDGs) in the 2000s but with the establishment of Inter-Agency and Expert Group on SDG Indicators (IAEG-SDGs), the SDGs have a clearer framework on how to monitor progress and the global community are grappling on how to effectively collect, analyse, visualise and report their successes.

Within the United Nations, there is an attempt in providing principles and tools on how best to report the SDGs at country and local level as its success lies in the ownership and accountability at all levels. The Secretary-General of the United Nations has been anxious on how the use of technologies can accelerate the SDGs and to facilitate the alignments with the values enshrined in the United Nations Charter, the Universal Declaration of Human Rights, and the norms and standards of International Laws.

In this paradigm, what should be the role of cartographers and geospatial information management experts to ensure how maps and geospatial information can be effectively used by the global community at all levels to communicate their challenges and successes from planning to implementing, monitoring, analysing, visualising and reporting on sustainable development? This presentation argues the importance of listening the challenges, asking questions to the policy makers, sharing best practices and building a consensus on the issues surrounding the SDGs before demonstrating the diverse cartographic skills available to communicate the intended message better. Hence, the importance of context has never changed and provides the cartographic and geospatial information management community an opportunity to demonstrate the potential and a vision of maps for sustainable for all through better communication.

\*The views expressed are those of the author(s) and do not necessarily reflect those of the United Nations.



## Eric Gundersen

**Mapbox CEO**

- FRI 19 JUL
- 13:30-14:30
- International Conference Hall, Plaza Heisei

### BIOGRAPHY

As CEO of Mapbox, Eric Gundersen oversees product, business, and marketing.

Eric started Mapbox to create tools that make location data powerful and available to everyone. Previously, Eric co-founded Development Seed, a consultancy that developed open source tools for international development agencies and nonprofits to map the world.

He holds a master's degree in International Development, and a dual bachelor's degree in Economics and International Relations from American University.

### Building a living map of the world updated from billions of sensors

Mapbox maps learn from every application they're embedded in. Over 640 million people use Mapbox every month. Every day these devices generate 14 billion anonymous sensor readings that are used to deliver precise traffic data and instantly ship over 100,000 daily changes to maps on any connected device. Using AI and machine learning, this information delivers precise, predictive drive times and finds the best routes for drivers.

Eric Gundersen, CEO and Founder of Mapbox, will speak about the future of mapping, from its roots with OpenStreetMap to sharing new plans on launching in Japan with SoftBank this summer. Gundersen will also do a live demo of this new AR Vision, turning cameras into co-pilots using AI-powered semantic segmentation, object detection, and classification to identify the variables that define a driver's journey. This live data with distributed sensors can detect construction, recognize street signs and speed limits, and identify potential hazards to enable augmented reality navigation and automated driving.

# Venue



A...Tokyo International Exchange Center (Plaza Heisei)

B...National Museum of Emerging Science and Innovation (Miraikan)

C...Tokyo Metropolitan Industrial Technology Research Center

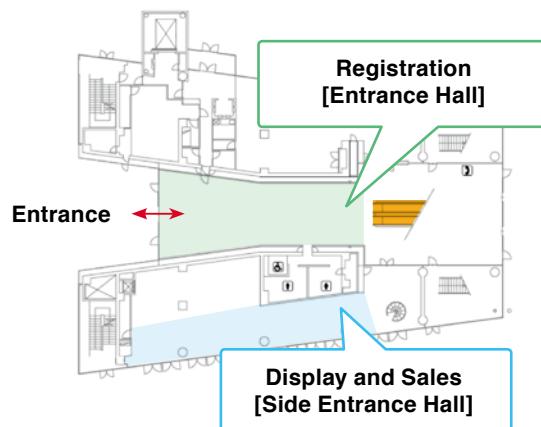
D...Telecom Center

# Floor Plan

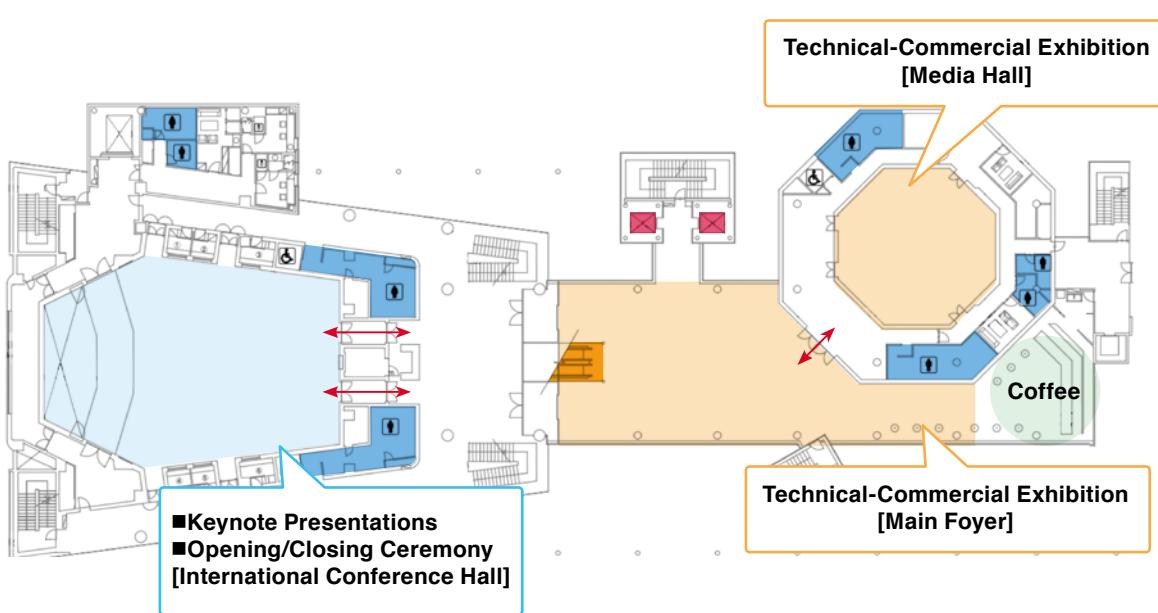
Escalator  
 Elevator  
 WC

## Plaza Heisei

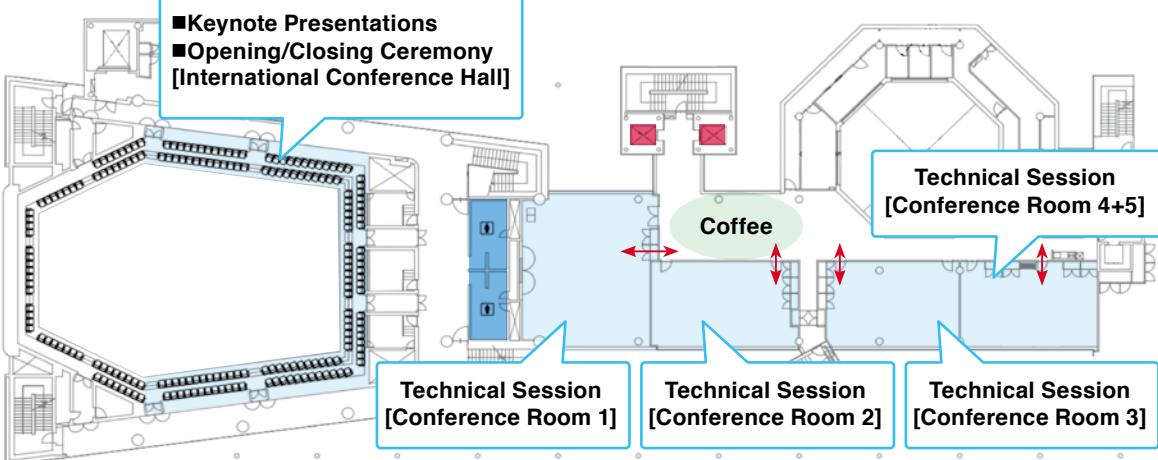
1F



3F



4F

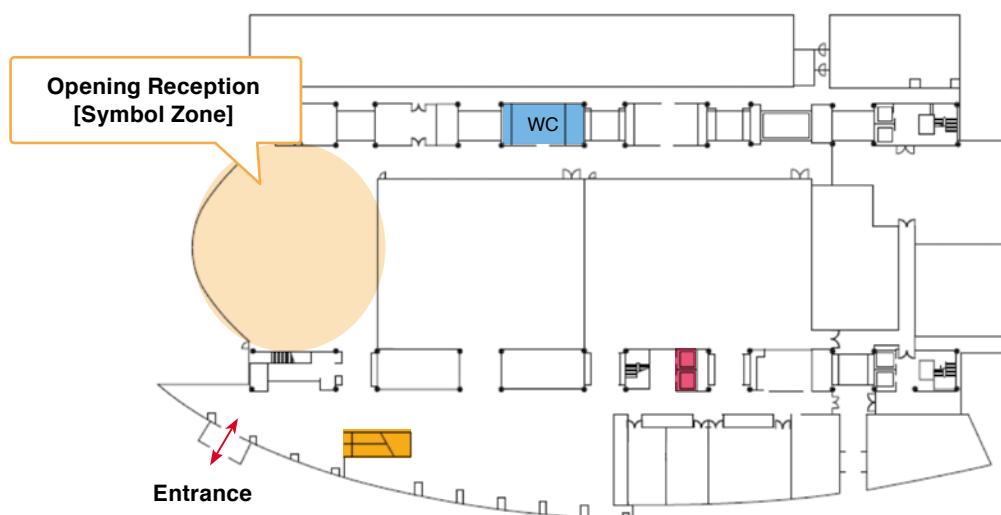


# Floor Plan

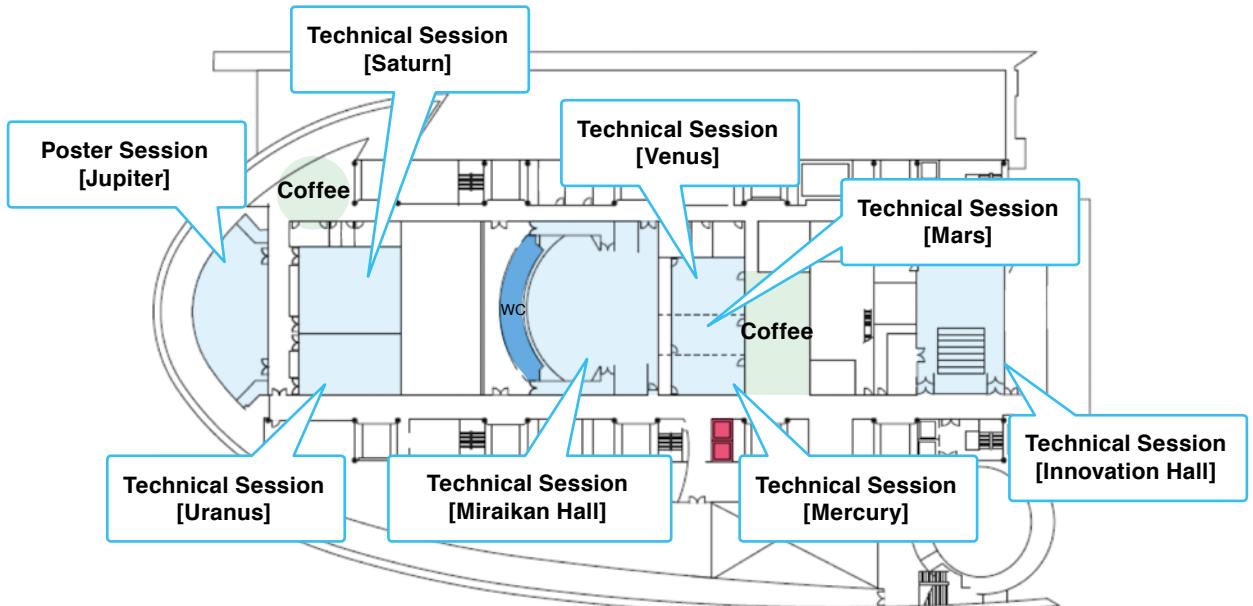
Escalator  
Elevator  
WC

## Miraikan - National Museum of Emerging Science and Innovation

1F



7F

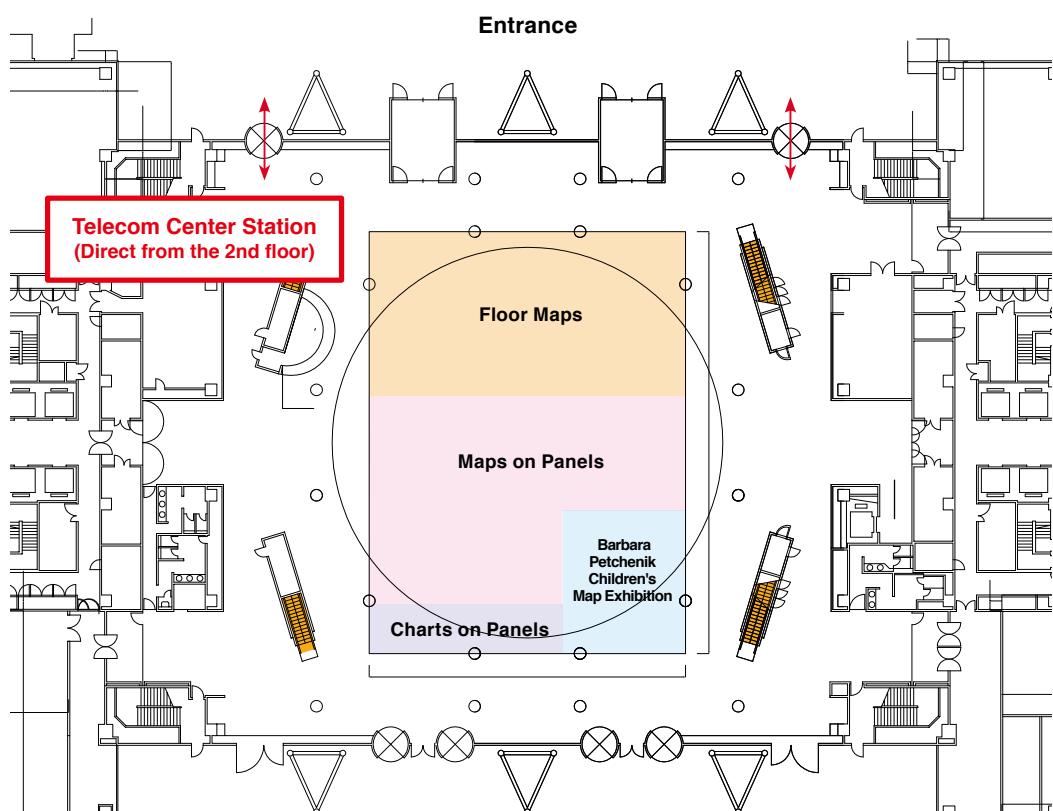


# Floor Plan

Escalator  
 Elevator  
 WC

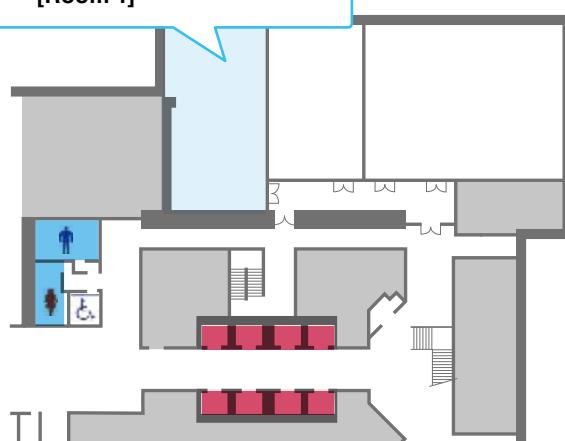
## TELECOM CENTER BUILDING

1F



20F

**International Cartographic Exhibition-Digital Products/Services Exhibition  
Globes & Atlases Exhibition**  
**[Room 1]**



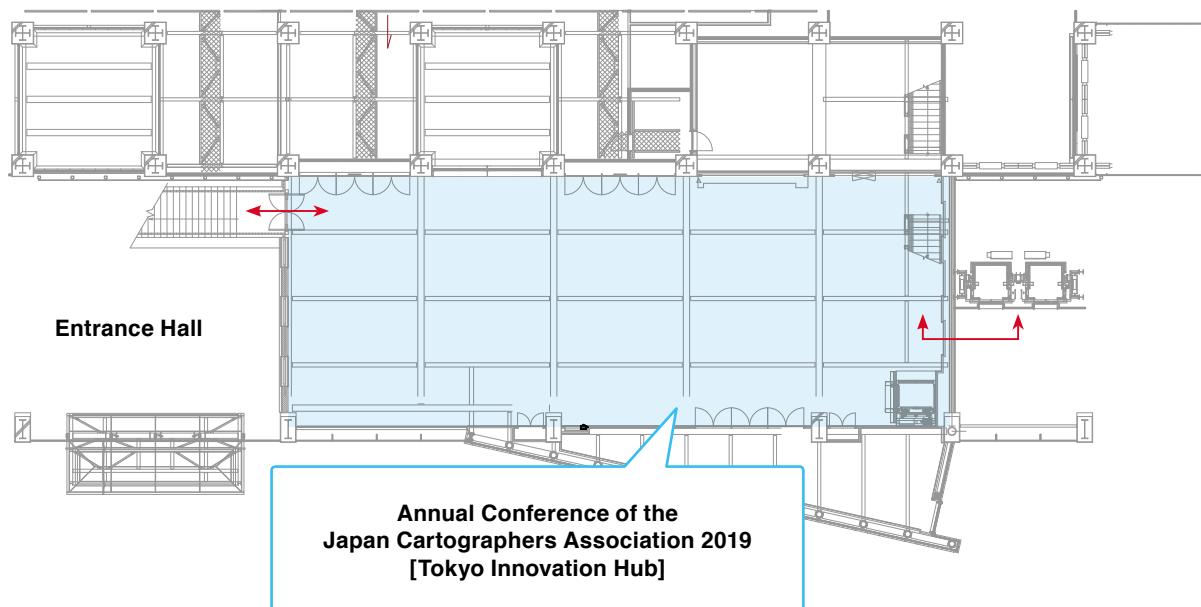
- Atlases
- Digital Products
- Digital Services
- Educational Cartographic Products
- Other Cartographic Products

# Floor Plan

## TOKYO METROPOLITAN INDUSTRIAL TECHNOLOGY RESEARCH INSTITUTE

\*Registration desk will be on the 1st floor

M2F



# ICC2019 Joint Activities

## Annual Conference of the Japan Cartographers Association 2019

**16<sup>th</sup> Jul. 10:00 - 18:00**

Presentations (oral, poster sessions), Workshop on “MIURA-ORI”, Japanese Cartographic Exhibition

**17<sup>th</sup> Jul. 10:00 - 13:30**

Special Session on “Technical Terms for Digital Mapping”, Presidential Address, Japanese Cartographic Exhibition  
# ICC2019 participants are allowed to join the meeting (All presentations are held in Japanese)

## Special Exhibition “Japanese Maps: Past, present and future”

Supported by the Future Map Consortium

**18<sup>th</sup> and 19<sup>th</sup> Jul. 10:00 - 17:00**

A variety of Japanese maps and tools for mapping, including a navigation system with the quasi-zenith satellite, an application for browsing old maps with smartphone, and aerial views of Tokyo.

# Everyone can freely visit and enjoy the exhibition.

# International Cartographic Exhibition

The official opening of the International Cartographic Exhibition will take place in Telecom Center Building on Tuesday the 16th July at 9:00.

During the cartographic exhibition countries from all over the world will exhibit most recent cartographic products in digital or paper format. Maps and cartographic products are submitted in 7 different categories:

- Maps on panels
- Charts on panels
- Atlases
- Digital Products
- Digital Services
- Educational Cartographic Products
- Other Cartographic Products

## Barbara Petchenik Children's World Map Drawing Competition

The competition was created by the International Cartographic Association in 1993 as a memorial for Barbara Petchenik, a past Vice president of the ICA and cartographer who had a lifelong interest in maps for children. The aim of the contest is to promote the creative representation of the world in graphic form by children.

188 drawings by national winners from 33 countries are exhibited in Telecom Center Building from 16th to 19th July.

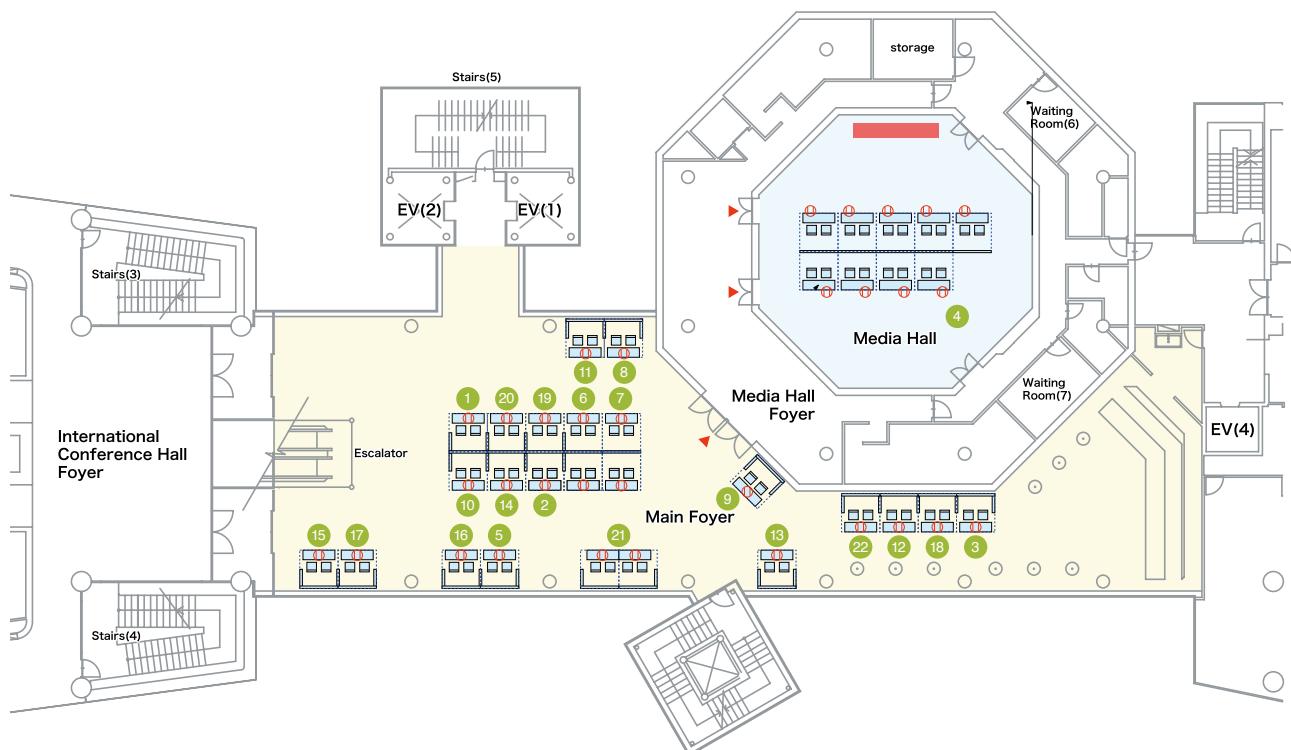
# International Technical-Commercial Exhibition

Local Organizing Committee of ICC2019 holds the Technical Exhibition sponsored by the following exhibitors in Tokyo International Exchange Center (Plaza Heisei) from 16th to 19th July.

\*In alphabetical order

- 1 AERO ASAHI CORPORATION
- 2 ASAHI ETIC CO., LTD.
- 3 Center for Spatial Information Science, the University of Tokyo & UTokyo Digital Archives Project
- 4 CHINA MAP CULTURAL AND CREATIVE INDUSTRY ALLIANCE
- 5 EAST VIEW GEOSPATIAL
- 6 Esri
- 7 Esri Japan Corporation
- 8 Hokkaido-Chizu Co., Ltd.
- 9 ICC2021 – Florence, ITALY
- 10 Japan Map Center
- 11 KIMOTO CO., LTD.
- 12 Laboratory for Cartographic Literacy
- 13 Mapping Technology Association
- 14 Ministry of Internal Affairs and Communication
- 15 ORBITAL NET INC.
- 16 Pacific Spatial Solutions, Inc. / Avenza Systems Inc.
- 17 PASCO CORPORATION
- 18 Remote Sensing Technology Center of Japan
- 19 SuperMap Japan CO., Ltd.
- 20 TEIKOKU - SHOIN
- 21 NGII with KCA
- 22 TOKYO GEOGRAPHICAL SOCIETY

■Publicity Wall



# Technical Tour

## T-Course A

**GSI (Geospatial Information Authority of Japan) and JAXA (The Japan Aerospace Exploration Agency)**

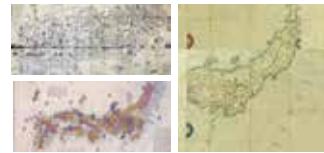
**19<sup>th</sup> of July, 9 am - 6 pm**



## T-Course B

**19<sup>th</sup> Century Early Modern Maps by Japanese map maker Nagakubo Sekisui at Koga-city: The National Diet Library and Koga Historical Museum**

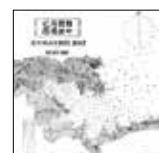
**17<sup>th</sup> of July, 8 am - 6 pm**



## T-Course C

**Marine Cartography Site at Tokyo Bay, supported by JHOD (The Hydrographic and Oceanographic Department, Japan Coast Guard)**

**16<sup>th</sup> or 18<sup>th</sup> of July, 1 pm - 4 pm**



## T-Course D

**The Hydrographic and Oceanographic Museum of JHOD (The Hydrographic and Oceanographic Museum, Japan Coast Guard)**

**16<sup>th</sup> or 18<sup>th</sup> of July, 2 pm - 3 pm**



## T-Course E

**National Diet Library (NDL)**

**17<sup>th</sup> of July, 2 pm - 4 pm**



## T-Course F

**Roppongi Hills Mori Tower and Diorama Model of Downtown Tokyo**

**16<sup>th</sup> of July, 2 pm - 5 pm**



## T-Course G

**Tokyo “Suribachi” Topography Tour and “Cartographic Night” at Shibuya town**

**17<sup>th</sup> of July**



## T-Course H

**Tokyo Landscape “The Canal and Rivers create the Tokyo”, discovery cruise by ship that special experience of Japanese Megalopolis History (Edo to Tokyo)**

**Departure at 3 pm and dissolution at 7 pm on 16<sup>th</sup> July**



## T-Course I

**High-School in Tokyo and Cartographic Education Class**

**19<sup>th</sup> of July, 1 pm - 4 pm**



# Social Program

## Opening Ceremony

Date: Monday, 15 July 6pm-8:40pm

Venue: Plaza Heisei International Conference Hall

## Opening Reception

Date: Tuesday, 16 July 6:30pm

Venue: National Museum of Emerging Science and Innovation (Miraikan), "Symbol Zone"

Enjoy the Opening Reception right under the "The Geo-Cosmos", the symbol exhibit of Miraikan.

This symbol produces a rendition of our Earth shining brightly in space with a super high precision exceeding 10 million pixels. It is the world's first "Globe-like display" using organic LED panels.

## Gala Dinner

Date: Friday, 19 July 7pm-9pm

Venue: Happo-en

URL: <http://happo-en.com/banquet/>

Enjoy the Gala Dinner which will take place in Happo-en restaurant.

Happo-en is grounded in all aspects of Japanese culture - traditional gardens, architecture, culinary techniques, art, music and many others - introducing the world of Japanese beauty and culture.



## Young Cartographers Social Gathering

Date: Wednesday, 17 July 6:30pm

Venue: National Museum of Emerging Science and Innovation(Miraikan)

\* The details will be announced on the ICC2019 Website.

## Orienteering

Date: Friday, 19 July 7am-9am

Event center: Open space under the big bridge of KIBA Park

## Japanese Culture and Sightseeing Tour

### CS- Tour A

**Japanese Culture and Sightseeing Tour  
(Supported by Tokyo Metropolitan Government)**

afternoon 16th, 18th of July

### CS- Tour B

**Mt. Fuji and Mt. Hakone,  
Scenic and Geoscience Volcanos tour**

15<sup>th</sup> of July 8 am - 7 pm



### CS- Tour C

**Heartful Japan "Town of Chichibu" and visit**

20<sup>th</sup> of July, 9 am - 9 pm



# Post Congress Tour

## PC-Tour A

Hiroshima Peace GIS and “Setouchi Inland Sea” Tour,  
plus Kyoto “Gion Festival”

**5 nights and 6 days**

**20<sup>th</sup> to 25<sup>th</sup> of July, 2019**



## PC-Tour B

18<sup>th</sup> Century, old Okinawa “Ryukyu” dynasty's map explore,  
plus Kyoto “Gion Festival”

**4 nights and 5 days**

**21<sup>th</sup> to 25<sup>th</sup> of July, 2019**



## PC-Tour C

Old Capitals, “Nara” and “Kyoto” Map Explore tour,  
plus Kyoto “Gion Festival”

**2 nights and 3 days**

**22<sup>nd</sup> to 24<sup>th</sup> of July,**



## PC-Tour D

Heartful Country, Town of Takahagi and 19<sup>th</sup> Century  
Modern Japanese map maker “Nagakubo Sekisui's Home town”

**1 nights and 2 days**

**21<sup>th</sup> to 22<sup>nd</sup> of July, 2019**



# Program at a Glance

	<i>MON 15 JUL</i>	<i>TUE 16 JUL</i>	<i>WED 17 JUL</i>	<i>THU 18 JUL</i>	<i>FRI 19 JUL</i>	<i>SAT 20 JUL</i>
AM	<u>Commission &amp; Workshops</u>	<u>Technical Sessions</u>	<u>Technical Sessions</u>	<u>Technical Sessions</u>	<u>Technical Sessions</u>	<u>General Assembly (2)</u>
		<u>Scientific Posters</u>	<u>Scientific Posters</u>	<u>Scientific Posters</u>	<u>Scientific Posters</u>	
		<u>Exhibition</u>	<u>Exhibition</u>	<u>Exhibition</u>	<u>Exhibition</u>	
PM	<u>General Assembly (1)</u>	Keynote (1)	Keynote (2)	Keynote (3)	Keynote (4)	<u>Closing Ceremony</u>
	<u>Commission &amp; Workshops</u>	<u>Technical Sessions</u>	<u>Technical Sessions</u>	<u>Technical Sessions</u>	<u>Technical Sessions</u>	
		<u>Scientific Posters</u>	<u>Scientific Posters</u>	<u>Scientific Posters</u>	<u>Scientific Posters</u>	
		<u>Exhibition</u>	<u>Exhibition</u>	<u>Exhibition</u>	<u>Exhibition</u>	
Evening	<u>Opening Ceremony</u>	<u>Opening Reception</u>	Young Cartographers Social Gathering		Gala Dinner	

— Miraikan - National Museum of Emerging Science and Innovation

— Plaza Heisei

— Telecom Center Building

— Tokyo Metropolitan Industrial Technology Research Institute

# Scientific Program at a Glance

MON 15 JUL		TUE 16 JUL		WED 17 JUL	
8:30-10:20 (Miraikan)	Session  T01-1                    Saturn T02-1                    Innovation Hall T12-1                    Uranus T25-1                    Mars Asia-1                  Conference room 4+5 T36-1                  Conference room 1	Poster Session P-1  Jupiter	Session  T01-5                    Saturn T02-5                    Innovation Hall T07-1                    Venus T09-3                    Miraikan Hall T13-1                    Uranus T18-1                    Mars T19-1                    Mercury Asia-5                  Conference room 4+5 T26-1                  Conference room 2 T42-1                  Conference room 3	Poster Session P-2  Jupiter	
9:20-10:20 (Plaza Heisei)			10:20-10:50 Coffee Break		
10:50-12:10	Session  T01-2                    Saturn T02-2                    Innovation Hall T04-1                    Mars T05-1                    Venus T12-2                    Uranus T24-1                    Mercury Asia-2                  Conference room 4+5 T06-1                  Conference room 2 T32b-1                  Conference room 3 T36-2                  Conference room 1	Session  T02-6                    Innovation Hall T07-2                    Venus T09-4                    Miraikan Hall T13-2                    Uranus T18-2                    Mars T30-1                    Saturn T31-1                    Mercury Asia-6                  Conference room 4+5 T26-2                  Conference room 2 T34/35-3                Conference room 1 T42-2                  Conference room 3			
13:30-14:30	13:00-17:00 General Assembly Miraikan Hall	Keynote 1	12:10-13:30 Lunch	Keynote 2	
14:50-16:10	Session  T01-3                    Saturn T02-3                    Innovation Hall T04-2                    Mars T05-2                    Venus T09-1                    Miraikan Hall T12-3                    Uranus T24-2                    Mercury Asia-3                  Conference room 4+5 T06-2                  Conference room 2 T32b-2                  Conference room 3 T34/35-1                Conference room 1	Session  T07-3                    Venus T09-5                    Miraikan Hall T13-3                    Uranus T23-1                    Mars T30-2                    Saturn T31-2                    Mercury T39-1                    Innovation Hall Asia-7                  Conference room 4+5 T06-4                  Conference room 2 T34/35-4                Conference room 1 T42-3                  Conference room 3	14:30-14:50 Break		
16:40-18:00	Session  T01-4                    Saturn T02-4                    Innovation Hall T04-3                    Mars T05-3                    Venus T09-2                    Miraikan Hall  T12-4                    Uranus T24-3                    Mercury Asia-4                  Conference room 4+5 T06-3                  Conference room 2 T32b-3                  Conference room 3 T34/35-2                Conference room 1	Session  T07-4                    Venus T09-6                    Miraikan Hall T13-4                    Uranus T23-2                    Mars T30-3                    Saturn  T31-3                    Mercury T39-2                    Innovation Hall T06-5                    Conference room 2 T34/35-5                Conference room 1 T42-4                    Conference room 3	16:10-16:40 Coffee Break		
18:00-	18:00-20:00 Opening Ceremony International Conference Hall	18:30-21:00 Opening Reception Symbol Zone			

Miraikan  
 Plaza Heisei

		<b>THU 18 JUL</b>		<b>FRI 19JUL</b>		<b>SAT 20 JUL</b>	
8:30-10:20 (Miraikan)	Session	T03-1	Mars	Poster Session P-3		Session	T08-1
9:20-10:20 (Plaza Heisei)		T07-5	Venus	Jupiter			Uranus
		T09-7	Miraikan Hall			T09-11	Miraikan Hall
		T13-5	Uranus			T10-1	Mars
		T21-1	Saturn			T11-3	Saturn
		T31-4	Mercury			T38-1	Conference room 4+5
		T17-1	Conference room 1			T40-1	Conference room 1
		T29-1	Conference room 4+5			T43-1	Conference room 3
10:20-10:50 <b>Coffee Break</b>							
10:50-12:10	<b>SS1</b>		<b>SS2</b>				
	Session	T03-2	Mars		Session	T08-2	Uranus
		T07-6	Venus			T09-12	Miraikan Hall
		T09-8	Miraikan Hall			T11-4	Saturn
		T13-6	Uranus			T30-7	Innovation Hall
		T21-2	Saturn			T27-1	Conference room 2
		T30-4	Innovation Hall			T38-2	Conference room 4+5
		T31-5	Mercury			T40-2	Conference room 1
		T17-2	Conference room 1			T43-2	Conference room 3
		T26-3	Conference room 2				
		T33-1	Conference room 3				
12:10-13:30 <b>Lunch</b>							
13:30-14:30	<b>Keynote 3</b>		<b>Keynote 4</b>				13:00-15:30
							<b>Closing Ceremony International Conference Hall</b>
14:50-16:10	Session	T03-3	Mars		Session	T08-3	Uranus
		T09-9	Miraikan Hall			T09-13	Miraikan Hall
		T11-1	Saturn			T11-5	Saturn
		T16-1	Mercury			T14-1	Mercury
		T28-1	Venus			T15-1	Mars
		T30-5	Innovation Hall			T30-8	Innovation Hall
		T41-1	Uranus			T32a-1	Venus
		T17-3	Conference room 1			T27-2	Conference room 2
		T26-4	Conference room 2			T37-1	Conference room 1
		T29-2	Conference room 4+5			T38-3	Conference room 4+5
		T33-2	Conference room 3			T43-3	Conference room 3
16:10-16:40 <b>Coffee Break</b>							
16:40-18:00	Session	T03-4	Mars		Session	T08-4	Uranus
		T09-10	Miraikan Hall			T11-6	Saturn
		T11-2	Saturn			T14-2	Mercury
		T16-2	Mercury			T15-2	Mars
		T30-6	Innovation Hall			T30-9	Innovation Hall
		T41-2	Uranus			T32a-2	Venus
		T17-4	Conference room 1			T27-3	Conference room 2
		T26-5	Conference room 2			T37-2	Conference room 1
		T29-3	Conference room 4+5			T43-4	Conference room 3
		T33-3	Conference room 3				
					19:00-22:00 <b>Gala Dinner</b> Happo-en		

# Tuesday, July 16

 Miraikan  
 Plaza Heisei  
 \*name...presenter

- 8:30-10:20 **T01-1 Art, History & Design** ..... **Saturn (Miraikan)**  
 Chair: Sharon Hayashi (York University)
- T01-1-1** Procedural Knowledge of Graphic Design for Analysing Graphic Elements in Historical ... Urban Maps  
Chenyang Xie
  - T01-1-2** Who were cartographers of manuscript topographic maps in the Enlightenment?  
Beata Medyńska-Gulij
  - T01-1-3** 3D art cartography in Belarus: The historical development and achievements in the modern period  
Anna German
  - T01-1-4** City maps: Dreams, Art, Cartography, Planning  
Cosimo Palagiano
- 8:30-10:20 **T02-1 Atlases - Theory and Principles** ..... **Innovation Hall (Miraikan)**  
 Chair: Francis Harvey (Leibniz-Institute for Regional Geography)
- T02-1-1** National atlases - an atlas type reconsidered  
Eric H Losang
  - T02-1-2** Atlases and Systems Theory within Systematic Cartography  
Vit Vozenilek
  - T02-1-3** 3D Carto-Graphics – Principles, Methods and Examples for Interactive Atlases  
René Sieber, Remo Eichenberger, Lorenz Hurni
- 8:30-10:20 **T12-1 Location Based Services I** ..... **Uranus (Miraikan)**  
 Chair: Haosheng Huang (University of Zurich)
- T12-1-1** Incorporating directional signs into indoor navigation systems  
Wangshu Wang, Haosheng Huang, Hao Lyu, Georg Gartner
  - T12-1-2** The development of a cognitive indoor route planning algorithm: which aspects to include?  
Nina Vanhaeren, Kristien Ooms, Philippe De Maeyer
  - T12-1-3** Linking perception to decision point complexity for adaptive indoor wayfinding support  
Laure De Cock, Kristien Ooms, Nico Van De Weghe, Philippe De Maeyer
  - T12-1-4** Positioning Locality Based on Cognitive Directions and Context in Indoor Landmark Reference System  
Yankun Wang, Weixi Wang, Xiaoming Li, Shengjun Tang, You Li
- 8:30-10:20 **T25-1 Ubiquitous Mapping** ..... **Mars (Miraikan)**  
 Chair: Masatoshi Arikawa (Akita University)
- T25-1-1** Intergenerational differences in the use of maps: results from an online survey  
Yoshiaki Wakabayashi
  - T25-1-2** Visual-Inertial Odometer-Based Global High Precision Indoor Human Navigation in a University Library  
Akinori Takahashi, Shinpei Ito, Masatoshi Arikawa, Ruochen Si
  - T25-1-3** Virtual Circular Geofences for Points and Regions of Interests with Spatial Context  
Masatoshi Arikawa, Hoshito Tokita, Ruochen Si, Ren Sato, Ryodai Tayama, Akinori Takahashi
- 9:20-10:20 **Asia-1 Opening Remarks and First Asia GIS Keynote** ..... **Conference Room 4+5 (Plaza Heisei)**  
 Chair: Yohta Kumaki (Senshu University)
- Asia-1-1** Brief opening remarks  
Anond Snidvongs (GISTDA)
  - Asia-1-2** 30 Years Development of Geographic Information Systems  
Deren Li (Wuhan University)
- 9:20-10:20 **T36-1 The transition to contemporary mappings** ..... **Conference Room 1 (Plaza Heisei)**  
 Chair: Kam Wing Fung (The University of Hong Kong)
- T36-1-1** The gradual reinforcement of Japanese mapping in pre-colonial Taiwan and Korea  
Shigeru Kobayashi
  - T36-1-2** Development and Publication of Volcanic Base Map Data  
Gen Nagano, Hironobu Tsuchihashi, Katsuhiro Okamoto, Yoshinori Numata
  - T36-1-3** Mapping time-distance  
Feng Qi, Seth Docherty

# Tuesday, July 16

Miraikan  
Plaza Heisei  
\*name...presenter

10:50-12:10 **Asia-2 Mapping and GIS in Asia I** ..... Conference Room 4+5 (Plaza Heisei)  
 Chair: Jianya GONG (Wuhan University)

**Asia-2-1** Assessing airport ground access by public transit in Chinese city-regions  
Xingjian Liu

**Asia-2-2** Mapping Geo-spatial Dimensions of Water in Jammu and Kashmir to Pursue Wider Peace  
Seema Mehra, Premendra Kumar Parihar

**Asia-2-3** Classifying and Mapping Street-Blocks Based on Multi-Source Spatio-Temporal Data  
Jiansi Yang, Shuai Liu, Mingsheng Liao, Yandong Wang

**Asia-2-4** Delineation of Chinese county-scale urban function patterns with the real-time Tencent user density  
Yao Yao, Jianfeng Zhou, Qingfeng Guan, Yaqian Zhai

10:50-12:10 **T01-2 Journey as Method** ..... **Saturn (Miraikan)**  
 Chair: Cristina M. Iosifescu Enescu (ETH Zurich, Switzerland)

**T01-2-1** "A journey as a flow": A personal spatio-temporal projection of the world.  
Aleksandra Stanczak, Antoni Moore

**T01-2-2** Drawing North America by Hand  
Anton Thomas

**T01-2-3** Maps of Literary Trails in Thessaloniki  
Alexandra Koussoulakou, Yiannis Mitzias, Konstantinos Ntovas, Symeon Simeonidis, Michail Bakoyannis

**T01-2-4** Borderknots – cartographying experiences of crossing borders  
Katrin Gattinger

10:50-12:10 **T02-2 Atlases – Processes and Tools** ..... **Innovation Hall (Miraikan)**  
 Chair: Eric Losang (Leibniz-Institute for Regional Geography)

**T02-2-1** The automation of processes of atlas mapping  
Sergey Anatolyevich Krylov, Gleb Igorevich Zagrebin, Anton Viktorovich Dvornikov, Dmitriy Sergeyevich Loginov, Ivan Evgenyevich Fokin

**T02-2-2** Graphical modeling with the chorematic method. A case study on Saudi Arabia.  
Mohsen Dhieb

**T02-2-3** Extending Exploration and Navigation Capabilities of the Atlas of Switzerland  
Michael Schmuki, René Sieber, Lorenz Hurni

**T02-2-4** Maps under the global condition: a new tool to study the evolution of cartographic language  
Pierre Cherrier, Sebastian Lentz, Jana Moser, Laura Pflug

10:50-12:10 **T04-1 Cartography and Children 1** ..... **Mars (Miraikan)**  
 Chair: CARLA CRISTINA SENA (UNESP)

**T04-1-1** Teaching basic map concepts in three countries: Azerbaijan, Hungary and United Arab Emirates  
José Jesús Reyes Nunez, Naeema Al Hosani, Nargiz Safaraliyeva

**T04-1-2** Spatial Thinking in Children's Education: The relationship between Geography and Cartography  
Paula Strina Juliász, Sonia Vanzella Castellar

**T04-1-3** Initiative aiming to introduce children to maps in Kenya  
Catherine Mugure Njore, Bartholomew Kuria Thiong'O, Charles Mwangi Kimari

**T04-1-4** School Atlas with Augmented Reality  
Nikola Petrov Yonov

10:50-12:10 **T05-1 Cartography in Early Warning and Crisis Management 1** ..... **Venus (Miraikan)**  
 Chair: Jiping Liu (Chinese Academy of Surveying and Mapping)

**T05-1-1** Using GIS and cartography as part of the whole-of-society approach to determine coercion into marine wildlife poaching and piracy.  
Peter Schmitz, Duarte Gonçalves

**T05-1-2** Role of geospatial information for disaster risk management as exemplified in recent large earthquakes in Japan  
Hiroshi Une, Takayuki Nakano

**T05-1-3** Evaluating earthquake-related ground failure mapping by combined traditional and modern methods  
Takayuki Nakano, Hiroshi Une, Kazuki Yoshida, Satoshi Fujiwara, Tomokazu Kobayashi

# Tuesday, July 16

Miraikan  
Plaza Heisei  
\*name...presenter

- T05-1-4** **The Integrated Disaster Reduction Intelligent Service System and its Application**  
Jiping Liu, Yong Wang, Mengmeng Liu, Shenghua Xu, Tao Jiang, Yang Gu

10:50-12:10 **T06-1 Cartography in the Mind** ..... **Conference Room 2 (Plaza Heisei)**

Chair: Sara Irina Fabrikant (University of Zürich)

- T06-1-1** **Representations of Place in the Human Brain**  
Amy Lobben, Megan McNally Lawrence, P. William Limpisathian
- T06-1-2** **Using fMRI to Explore the Influence of Road Network Patterns on Geospatial Cognition**  
Bing Liu, Weihua Dong, Lin Zhu, Huiping Liu, Liqiu Meng
- T06-1-3** **Using Spatial Image Schemata in the characterization of spatial relations**  
Maria Engracinda Dos Santos Ferreira, Luciene Stamato Delazari
- T06-1-4** **Our global-scale cognitive map: is it influenced by our place of residence or education?**  
Lieselot Lapon, Kristien Ooms, Philippe De Maeyer

10:50-12:10 **T12-2 Location Based Services II** ..... **Uranus (Miraikan)**

Chair: Georg Gartner (TU Wien)

- T12-2-1** **Location Based Services: Research Trends and Open Challenges**  
Haosheng Huang, Georg Gartner, Jukka Krisp, Martin Raubal, Nico Van De Weghe
- T12-2-2** **Trajectory-based POI recommendations for mobile maps**  
Shane Loeffler
- T12-2-3** **Collecting reliable training data to extract tourism strolling behaviour from smartphone GPS logs during walking**  
Hisatoshi Ai, Hideki Kaji
- T12-2-4** **Classifying complex road features in the context of car driver education**  
Jukka M. Krisp, Andreas Keler

10:50-12:10 **T24-1 General approaches** ..... **Mercury (Miraikan)**

Chair: Peter Jordan (Austrian Academy of Sciences)

- T24-1-1** **Cartographers and geographers as toponym users, creators, and promoters. A linguistic perspective on cartographic and textual dissemination of geographical names**  
Wojciech Włoskowicz
- T24-1-2** **On the SCJ report "Challenges for the national standardisation of geographical names in Japan"**  
Kohei Watanabe, Kohei Okamoto, Akihiko Takagi, Takashi Morita, Shigeko Haruyama, Yoshiyasu Ida, Yumiko Takizawa, Hiroshi Tanabe, Takashi Todokoro, Yoshiki Wakabayashi
- T24-1-3** **From Spatial to Platital Information Systems: For a Better Representation of the Sense of Place**  
Yaïves Ferland, Mir Abolfazl Mostafavi

10:50-12:10 **T32b-1 Urbanization and urban shrinkage** ..... **Conference Room 3 (Plaza Heisei)**

Chair: Tomoko Kubo (University of Tsukuba)

- T32b-1-1** **Urban cartography in the morphogenetic analysis of urban spaces: the case of the Boavista axis in the city of Porto**  
Mário Gonçalves Fernandes, Rui Passos Mealha
- T32b-1-2** **Housing challenges in shrinking and aging Japanese cities**  
Tomoko Kubo
- T32b-1-3** **Housing issue in shrinking Russian cities: mapping the reality**  
TElena Batunova, Maria Gunko

10:50-12:10 **T36-2 The transition to modern mappings** ..... **Conference Room 1 (Plaza Heisei)**

Chair: Shigeru Kobayashi (Osaka University)

- T36-2-1** **Aerial Surveys and Geographic Information in Modern China**  
Hajime Yamamoto
- T36-2-2** **Mapping Reality and Virtuality: Paintings, Maps and Hydrographical Surveying about British and American Settlements of the Shanghai Bund, 1845-1860**  
Kam Wing Fung
- T36-2-3** **Landscape-style Maps in Traditional Chinese Local Government**  
Akihiro Osawa
- T36-2-4** **The changing use-cases of medium and large-scale geological maps in Hungary**  
Gáspár Albert

# Tuesday, July 16

 Miraikan  
 Plaza Heisei  
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- 13:30-14:30 **Keynote Presentation 1** ..... **International Conference Hall (Plaza Heisei)**  
Venkatesh Raghavan
- 14:50-16:10 **Asia-3 Mapping and GIS in Asia II** ..... **Conference Room 4+5 (Plaza Heisei)**  
 Chair: Anthony Yeh (The University of Hong Kong)
- Asia-3-1** **Design of 2D Pedestrian Navigation Interface for 3D Pedestrian Navigation**  
A.G.O. Yeh, Run Shi, Teng Zhong
  - Asia-3-2** **STORY OF CREATING GENDER ATLAS OF INDIA: Some Insights of a Principal Investigator**  
Seema Mehra
  - Asia-3-3** **Research on Public Space Vitality Evaluation Method Based on Time-Space Trajectory Behavior Pattern Recognition**  
Xia Zhang, Senqi Wang
  - Asia-3-4** **The Influence Analysis and Layered Extraction of Cognitive Landmarks**  
Hong Fan, Jianqi Ouyang
- 14:50-16:10 **T01-3 Mapping the Ephemeral** ..... **Saturn (Miraikan)**  
 Chair: Nick Lally (University of Kentucky)
- T01-3-1** **Cartographic Tools for Mapping Dreams**  
Cristina M. Iosifescu Enescu, Lorenz Hurni
  - T01-3-2** **Sounding out Place and Cultural Memory in Tempelhofer: Human Scale**  
Elina Lex
  - T01-3-3** **Points Further North: An Acoustemological Cartography of Non-Place**  
Michael Klaus Trommer, Graham Wakefield
  - T01-3-4** **Mapping Perception of Place through Emotion, Memory, Senses, and the Imaginary**  
Joanna Gardener, William Cartwright, Lesley Duxbury, Amy Griffin
- 14:50-16:10 **T02-3 National atlases** ..... **Innovation Hall (Miraikan)**  
 Chair: Qingwen Qi (National Atlases Editorial Office of China)
- T02-3-1** **The new National Atlas of Hungary – volume Natural Environment**  
Károly Kocsis, Zsombor Nemerkényi, László Zentai, Gábor Gercsák
  - T02-3-2** **A new work of the National Atlas of Spain called Spain on Maps. A Geographic Synopsis has been published**  
Noelia Pérez, Andrés Arístegui, Pilar Sánchez-Ortiz, Alfredo Del Campo
  - T02-3-3** **Topic Selection and Structure in the National Atlas of Switzerland**  
Raphael Vomsattel, René Sieber, Lorenz Hurni
  - T02-3-4** **Creation of the National Atlas of the Arctic**  
Andrey Tatarenkov
- 14:50-16:10 **T04-2 Cartography and Children 2** ..... **Mars (Miraikan)**  
 Chair: Yaïves Ferland (Université Laval)
- T04-2-1** **Cartographical Knowledge and the training of Geography teachers**  
Carla Cristina Reinaldo Gimenes De Sena, Barbara Gomes Flaire Jordão, Sonia Maria Vanzella Castella
  - T04-2-2** **Liber chronicarum, Carta marina and other mappae mundi**  
Beata Fijołek-Soska
  - T04-2-3** **Geography education by the combination use of GIS and AR**  
Koji Ohnishi, Hiroaki Akimoto, Yoshihiro Ugawa, Satoru Itoh
- 14:50-16:10 **T05-2 Cartography in Early Warning and Crisis Management 2** ..... **Venus (Miraikan)**  
 Chair: Anne RUAS (IFSTTAR)
- T05-2-1** **Hazard-based images comparison methods for damage assessment in emergency mapping**  
Jean-François Girres
  - T05-2-2** **Mapping Violent Presence of Armed Actors in Colombia**  
Javier Osorio, Mohamed Mohamed, Viveca Pavon, Susan Brewer-Osorio
  - T05-2-3** **The Swiss joint information platform for natural hazards**  
Philipp Angehrn, Sabina Steiner, Christophe Lienert
  - T05-2-4** **Spatial Data modelling to study and improve waste management after hurricanes. The case of French West Indies**  
Anne Ruas, Serge Lhomme

# Tuesday, July 16

Miraikan  
Plaza Heisei  
\*name...presenter

- 14:50-16:10 **T06-2 Wayfinding with landmarks:  
from the world to the map** ..... **Conference Room 2 (Plaza Heisei)**  
 Chair: Petr Kubíček (Masaryk University)
- T06-2-1** **The Influence of Spatial Familiarity on Landmark Salience Sensibility Based on Eye Tracking**  
Litao Zhu, Milan Konečný, Jie Shen, Zdeněk Stachoř, Hana Švedová
  - T06-2-2** **Experiment on People's Selection of Route Landmarks from Different Types of Geospatial Pictures**  
Pyry Kettunen
  - T06-2-3** **Influence of Viewing Field on Zoom Levels in Pedestrian Orientation Task Using Smartphones**  
Bonan Wei, Jochen Schiewe
  - T06-2-4** **Task-Oriented Display of Landmark Pictograms in Maps**  
Julian Keil, Dennis Edler, Lars Kuchinke, Frank Dickmann
- 14:50-16:10 **T09-1 GAM Research Agenda** ..... **Miraikan Hall (Miraikan)**  
 Chair: X.Angela Yao (University of Georgia)
- T09-1-1** **New Paradigm in Mapping: A Critique on Cartography and GIS**  
Bin Jiang
  - T09-1-2** **Is there a paradigm shift for GIS data representation and analysis?**  
Xiaobai Angela Yao
  - T09-1-3** **Methods for the Geographic Representation of Interpersonal Relationships and Social Life**  
Clio Andris, Dipto Sarkar
- 14:50-16:10 **T12-3 Location Based Services III** ..... **Uranus (Miraikan)**  
 Chair: Jukka Krisp (University of Augsburg)
- T12-3-1** **The influence of user characteristics on spatial perception differences in 3D visual environments**  
Lina Huang, Yanfang Liu, Shen Ying
  - T12-3-2** **Using Cartograms for Visualizing extended Floating Car Data (xFCD)**  
Christian Röger, Jukka M. Krisp
  - T12-3-3** **Positioning Error in Mobile Phone Tracking Data with Consideration of Geographic Environment Factors**  
Xiaoqing Song, Yi Long, Ling Zhang
  - T12-3-4** **Solution for indoor positioning using WIFI networks**  
Carolina Aguilar Aravena, Luciene Stamato Delazari
- 14:50-16:10 **T24-2 Place names and identity** ..... **Mercury (Miraikan)**  
 Chair: Sungjae Choo (Kyung Hee University Seoul)
- T24-2-1** **Toponyms' contribution to identity: The case study of Rabat (Morocco)**  
Malak Alasli
  - T24-2-2** **Memory and local Identity: the Persistence of Colonial-Era Street Names in Hong kong after 1997**  
Wenchuan Huang
  - T24-2-3** **Mapping the core and periphery applied to a choronym (the case of Székely Land)**  
Zsombor Bartos-Elekes
  - T24-2-4** **Unveil the 'lost toponyms' in the northern part of the Menoreh Mountains, Java, Indonesia**  
Albina Apriadsa, Habib Sidiq Anggoro, Ari Cahyono, Rossaydiana Apriadna
- 14:50-16:10 **T32b-2 Behavior and landscape of cities** ..... **Conference Room 3 (Plaza Heisei)**  
 Chair: Jun Yamashita (Kyushu University)
- T32b-2-1** **Spatial Analysis of Tourist Spots in Central Tokyo Using Online Geotagged Photographs from Flickr**  
Bochra Bettaieb, Yoshiki Wakabayashiong
  - T32b-2-2** **Mapping foreign residents in Japan's major cities**  
Yoshitaka Ishikawa
  - T32b-2-3** **Spatial-Temporal Landscape Analysis of Kallang-Seletar Transect, Singapore**  
Tao Wang

# Tuesday, July 16

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- 14:50-16:10 **T34/35-1 The frontier of crowdsourced geospatial information** ..... **Conference Room 1 (Plaza Heisei)**  
 Chair: Yuichiro Nishimura and Toshikazu Seto (Nara Women's University and University of Tokyo)
- T34/35-1-1 Mobile Tools for Community Scientists**  
Maria Antonia Brovelli, Candan Eylul Kilsedar, Francesco Frassinelli
  - T34/35-1-2 Potential of crowdsourced data for integrating landmarks and routes for rescue in mountain areas**  
Marie-Dominique Van Damme, Ana-Maria Olteanu-Raimond, Yann Méneroux
- 16:40-18:00 **Asia-4 Asia GIS Business Meeting** ..... **Conference Room 4+5 (Plaza Heisei)**  
 Chair: Anond Snidvongs (GISTDA, Thailand)
- 16:40-18:00 **T01-4 Alternative Urban Cartographies** ..... **Saturn (Miraikan)**  
 Chair: Joanna R Gardener (Swinburne University of Technology and RMIT University)
- T01-4-1 "Buoyant Cartographies": Strata-Mapping the Detroit River Border**  
Taien Ng-Chan
  - T01-4-2 Mapping Heterotopia: Port B's Excavation of Asia in Tokyo**  
Sharon Hayashi
  - T01-4-3 Mapping as a visual arts practice: social geographies of contemporary Beirut**  
Lee Frederix
- 16:40-18:00 **T02-4 Historical Atlases** ..... **Innovation Hall (Miraikan)**  
 Chair: Thomas Schulz (Swiss Federal Statistical Office)
- T02-4-1 Historic Atlases of Polish Towns - status at the end of 2018**  
Zenon Kozięć, Radosław Golba, Agnieszka Piłarska, Roman Czaja
  - T02-4-2 Unknown Unknowns in Map Preparation for Historical Atlases**  
Pavel Seemann, Tomas Janata
  - T02-4-3 Creating a Digital Atlas of French Public Architecture (1795 – 1840)**  
Lena Krause
- 16:40-18:00 **T04-3 Cartography and Children 3** ..... **Mars (Miraikan)**  
 Chair: José Jesús Reyes Nunez (Eotvos Lorand University)
- T04-3-1 The importance of History of Cartography in the Geography teaching**  
Carla Cristina Sena
  - T04-3-2 Geoliteracy, Cartology, and a Mobile Serious Game**  
Yaïves Ferland, Margot Kaszap
- 16:40-18:00 **T05-3 Cartography in Early Warning and Crisis Management 3** ..... **Venus (Miraikan)**  
 Chair: Apostolos Papakonstantinou (Aegean University)
- T05-3-1 Visualization of fire brigade interventions based on statistical data**  
Łukasz Wielebski
  - T05-3-2 Online Hazard Maps, Risk Communication, Acceptance and Usage Continuance Intention Model: A Selected Review of Literature**  
Kartika Puspita Sari, Hidehiko Kanegae
  - T05-3-3 Cartographies of Genocide**  
Alberto Giordano
  - T05-3-4 Mapping refugee litters in the eastern coast of Lesvos using UAS, an emerging marine litter problem.**  
Apostolos Papakonstantinou, Konstantinos Topouzelis, Michaela Doukari, Olympios Andreadis
- 16:40-18:00 **T06-3 Maps, mountains and routing** ..... **Conference Room 2 (Plaza Heisei)**  
 Chair: Pyry Kettunen (Finnish Geospatial Research Institute (FGI), National Land Survey of Finland)
- T06-3-1 Deconstructing the relief inversion effect: Contributors of the problem and its solutions**  
Arzu Coltekin, Gianna Hartung, Martina Meyer
  - T06-3-2 Improving the search for victims in mountain with geovisualization and competing hypotheses management**  
Matthieu Viry, Marlène Villanova-Oliver, Jacques Gautier, Matthew Sreeves, Paule-Annick Davoine
  - T06-3-3 Evaluation of Map Signs for Evacuation Purposes**  
Zdeněk Stachoň, Petr Kubicek, Hana Svedova, Jie Shen, Xinqian Wu, Milan Konecný

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- T06-3-4** A framework for automatically visualizing and recommending efficient routes  
Stefan Fuest, Monika Sester

- 16:40-18:00 **T09-2 Flood mapping and water system** ..... **Miraikan Hall (Miraikan)**  
 Chair: Clio Andris (Georgia Institute of Technology)

- T09-2-1** A Mid-Axis extraction of heterogeneous river network data with topological consistency  
Hai Hu, Lili Song, Zonglin Yin, Min Yang

- T09-2-2** A MULTI-CRITERIA DECISION SUPPORT SYSTEM IN THE ANALYSIS OF FLOOD RISK AND VULNERABILITY MAPPING IN SULEJA, NIGER STATE, NIGERIA  
Halima Sadiya Abdullahi, Nura Khaliel Umar, Ado Usman Kibon

- T09-2-3** Modelling and Mapping Elusive Locations of Historic Water-Powered Grist Mills  
Michael Edward Hodgson, Silvia Piovan

- T09-2-4** Spatio-Temporal Mapping of Water Consumption at Public Institutions: Case of the United Arab Emirates University  
M. M. Yagoub

- 16:40-18:00 **T12-4 Location Based Services IV** ..... **Uranus (Miraikan)**  
 Chair: Tinghua Ai (Wuhan University)

- T12-4-1** Floating Car Data and Fuzzy Logic for classifying congestion indexes in the city of Shanghai  
Maja Kalinic, Jukka M. Krisp

- T12-4-2** Combining Location2Vec with LSTM to predict next locations from trajectory data  
Shanshan Han, Fu Ren, Qingyun Du

- T12-4-3** A Method for extracting multi-scale stay feature of trajectory based on OPTICS  
Minshi Liu, Yi Long

- 16:40-18:00 **T24-3 Place names and map design** ..... **Mercury (Miraikan)**  
 Chair: Cosimo Palagiano (Sapienza University of Rome)

- T24-3-1** Fifty shades of Roboto: Text Design Choices and Categories in Multi-Scale Maps  
Sébastien Biniek, Guillaume Touya, Gilles Rouffineau

- T24-3-2** Multilingualization Experiment of Geographical Name Information Using Vector Tile Format  
Masaki Suga, Koji Otsuka, Yoshikazu Honda

- T24-3-3** Point Label Placement on Hexagonal Map Grids  
Tinghua Ai, Yingzhe Lei

- T24-3-4** Geographical names to support monitoring of the regional dynamic in Magelang, Central Java, Indonesia  
Ari Cahyono, Rossaydiana Apriadna, Yuniarisita Setyo Wulandari, Siti Martha Uly Br Sinaga

- 16:40-18:00 **T32b-3 Urban governance, development, and mapping platform** ..... **Conference Room 3 (Plaza Heisei)**  
 Chair: Jun Tsutsumi (University of Tsukuba)

- T32b-3-1** VGI contributors' awareness of geographic information quality and its effect on data quality: a case study from Japan  
Jun Yamashita, Toshikazu Seto, Yuichiro Nishimura, Nobusuke Iwasaki

- T32b-3-2** Challenges in creating a 3D participatory platform for urban development  
Thibaud Chassin, Jens Ingensand, Maryam Lotfian, Olivier Ertz, Florent Joerin

- T32b-3-3** UFPR CampusMap: a laboratory for a Smart City developments  
Luciene Stamato Delazari, Leonardo Ercolin Filho, Ana Luiza Stamato Delazari Skroch

- T32b-3-4** Mapping Building Roof over Large Areas with Images of Public Available Map Services: Semantic Segmentation and Footprint Regularization  
Yuchu Qin, Shuai Gao, Miao Liu

- 16:40-18:00 **T34/35-2 Geo for all: GIS education and volunteered geographic information** ..... **Conference Room 1 (Plaza Heisei)**  
 Chair: Nobusuke Iwasaki (The National Agriculture and Food Research Organization)

- T34/35-2-1** A Climate Event Portal for Citizen Science  
Andreas Divanis, Liqiu Meng

- T34/35-2-2** Web Cartography going public: Developing a Massive Open Online Course (MOOC) for cartographic prosumers  
Lorenz Hurni, Charalampos Gkonos, Hans Rudolf Baer

- T34/35-2-3** Auto-filtering validation in citizen science biodiversity monitoring: a case study  
Maryam Lotfian, Jens Ingensand, Olivier Ertz, Simon Oulevay, Thibaud Chassin

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## Poster

8:30-18:00

- Poster Session P1 ..... Jupiter (Miraikan)**
- P1-01** **Living Among the Dead in the Manila North Cemetery: A Cartographic Re-Imagination**  
Patricia Ocampo Algura
  - P1-02** **Mapping vanished mountain shapes – The struggle between limestone mining and establishing a natural park at Mount Bukō—**  
Hiroko Toyota, Daiki Ito, Shuya Suzuki, Ryohei Hara, Junxiang Wang
  - P1-03** **The topography of the world by IN-YOU-ZU**  
Yukihide Akiyama, Izumi Sakamoto
  - P1-04** **Social-Environmental Atlas of the Lençóis Maranhenses area in Northeastern Brazil. First results of a methodological approach.**  
Reinaldo Paul Pérez Machado
  - P1-05** **Atlas of Yellowstone, 2nd Edition: Celebrating 150 Years of the World's First National Park, 1872-2022**  
W. Andrew Marcus, James E. Meacham, Justin T. Menke, Aleathea Y. Steingisser, Ann E. Rodman
  - P1-06** **Atlas of Indonesian Batik: Javanese Batik**  
Candra Sari Djati Kartika, Zulfa Nur'Aini 'Afifah, Adriati Annisa Utami
  - P1-07** **Development of an online learning environment for geography and geology using Minecraft**  
Junko Iwahashi, Yoshiharu Nishioka, Daisaku Kawabata, Akinobu Ando, Hiroshi Une
  - P1-08** **1/30 scale of Japan topography model realized with Minecraft**  
Yoshiharu Nishioka
  - P1-09** **National map contest for cartographic education**  
Takuma Uda, Takaki Okatani
  - P1-10** **Variation of Geospatial Representation of Community Hazard Maps with Disaster Prevention Activities**  
Toru Murayama
  - P1-11** **3D Interactive Visualization Method of Urban Waterlogging Based on Cesium**  
Xu Zhang, Wei Zhou, Jie Shen, Lukáš Herman, Yixian Du
  - P1-12** **Anticipating the Flood. Community-based cartography for disaster flood events in Argentina.**  
Ignacio Agustín Gatti, Federico Ariel Robledo, Sol Hurtado, Julieta Caneva, Diego Moreira, Mariano Re, Elodie Brache, Magdalena Falco, Leandro Kazimierski, Anna Paula Micou
  - P1-13** **Geomorphological maps as the basis of hazard mapping in Japan**  
Yohta Kumaki, Sumiko Kubo
  - P1-14** **A tool for generating testable pop-out effects in geovisual displays**  
Tumasch Reichenbacher
  - P1-15** **Combined GPS and motion-tracker data for activity levels and various route selections in everyday travel**  
Kaito Yoshida, Madoka Nakajima, Takashi Morita
  - P1-16** **Context-Aware POI Sequence Recommendation with Attention-Based Neural Network**  
Jianfeng Huang, Yuefeng Liu, Yue Chen, Chen Jia
  - P1-17** **No Sudden Audio Switch -- Preventing discontinuous POI audio playing in LBS**  
Ruochen Si, Masatoshi Arikawa, Hideki Kaji, Tianqi Xia, Ryosuke Shibasaki
  - P1-18** **Understanding landmark types in human navigation from a database perspective**  
Hao Lyu, Wangshu Wang
  - P1-19** **An interactive map of Tunisian toponymy.**  
Mohsen Dhibe
  - P1-20** **Mobile Geographic Visualization Service for Marine Safety Information based on Geo-Location Based Augmented Reality**  
Jaeseong Ahn, Hwahwan Kim, Jeongyun Lee
  - P1-21** **Managing coverage holes in IoT monitoring sensor networks**  
Roya Habibi, Ali Asghar Alesheikh
  - P1-22** **Updating of mountain trails on the “Digital Japan Basic Map” using big data of walking paths**  
Kiyoshi Nakaminami, Koji Otsuka, Yoshikazu Honda
  - P1-23** **How to read ‘Emotional Cartographies’: Rethinking (Carto)graphic Representation and Semantics**  
Nevena Markovic

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- P1-24** **Urban scene classification of high-resolution remote sensing images combined with spatial co-occurrence of POI**  
Yu Su, Yanfei Zhong
- P1-25** **Method of Indoor Map Unified Mathematics Basic Transformation Based on Transitional Projection Plane**  
Weixin Sun, Zhiyong Xue, Heyuan Li
- P1-26** **Research of Ubiquitous Information Aggregation Mechanism for Location Based Service**  
Zhiyong Xue, Weixin Sun, Heyuan Li
- P1-27** **The design and auto map-making technology for deformed traffic route map**  
Xianhua Cai, Yuan Zhang, Xiao Fu

# Wednesday, July 17

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8:30-10:20	<b>T01-5 Constructions &amp; Abstractions</b> ..... <span style="color: red;">Saturn (Miraikan)</span>
	Chair: William Cartwright (RMIT)
	<b>T01-5-1</b> <b>Geovisualizing space and time in a science-art exhibit</b> <u>Javier A. Arce-Nazario</u>
	<b>T01-5-2</b> <b>Project “What connects us to the world?” : Constructions of artistic cartographic representations</b> <u>Vânia L.C.A. Souza, Maria R.M. Matos</u>
	<b>T01-5-3</b> <b>Projecting emotions from artworks to maps using neural style transfer</b> <u>Edyta Paulina Bogucka, Liqui Meng</u>
	<b>T01-5-4</b> <b>Mapping dynamic, non-Euclidean spaces</b> <u>Nick Lally, Luke Bergmann</u>
8:30-10:20	<b>T02-5 Statistical and Political Atlases</b> ..... <span style="color: red;">Innovation Hall (Miraikan)</span>
	Chair: Oren Raz (Central Bureau of Statistics Israel)
	<b>T02-5-1</b> <b>Statistical Atlas of Poland and statistical atlases of voivodships</b> <u>Maciej Zych, Katarzyna Medolińska</u>
	<b>T02-5-2</b> <b>Retro-atlases II: a new edition of the first Statistical Atlas of Switzerland (1897)</b> <u>Olaf König</u>
8:30-10:20	<b>T07-1 Educational resources</b> ..... <span style="color: red;">Venus (Miraikan)</span>
	Chair: Laszlo Zentai (Secretary-General & Treasurer ICA, Hungary)
	<b>T07-1-1</b> <b>An analysis of the representation of sustainable development goals in textbook maps and atlases in educational contexts</b> <u>Sandra Sprenger, Carina Peter</u>
	<b>T07-1-2</b> <b>Solar System Cartography for High School Education: A Dual Scale Approach</b> <u>Stephan Wondrak</u>
	<b>T07-1-3</b> <b>The Introduction Chapter of the Swiss World Atlas 2017 - An Innovative Cartographic Education Tool in Switzerland</b> <u>Christian Haeberling, Katharina Henggeler, Lorenz Hurni</u>
8:30-10:20	<b>T09-3 Raster Data Analysis</b> ..... <span style="color: red;">Miraikan Hall (Miraikan)</span>
	Chair: Tinghua Ai (Wuhan University)
	<b>T09-3-1</b> <b>Run length coding and efficient compression of hexagonal raster data based on Gosper curve</b> <u>Rui Xin, Tinghua Ai</u>
	<b>T09-3-2</b> <b>Rural Road Extraction using Object Based Image Analysis (OBIA): A case study from Assam, India</b> <u>Ankita Medhi, Ashis Kumar Saha</u>
	<b>T09-3-3</b> <b>A fast and simple algorithm for calculating flow accumulation matrices from raster digital elevation models</b> <u>Guilyun Zhou, Wenyan Dong, Hongqiang Wei</u>
	<b>T09-3-4</b> <b>Validating the vertical quality of SRTM digital elevation model of the Mirim Lagoon hydrographic basin</b> <u>Andrea Lopes lescheck, Patricia Andréia Paiola Scalco</u>
8:30-10:20	<b>T13-1 Map Design I: Perception and Cognition</b> ..... <span style="color: red;">Uranus (Miraikan)</span>
	Chair: Ian Muehlenhaus (University of Wisconsin-Madison)
	<b>T13-1-1</b> <b>Methods and tools for automated production of origin-destination flow maps</b> <u>Daniel M Stephen, Bernhard Jenny</u>
	<b>T13-1-2</b> <b>A comparative analysis of visualization methods of travel time for schematic road map</b> <u>Xiaotong Hou, Peng Ti</u>
	<b>T13-1-3</b> <b>Cargo flow maps: design principles and automated generation</b> <u>Timofey Samsonov, Platon Yasev</u>
	<b>T13-1-4</b> <b>Another new design for an old map</b> <u>Kenneth Field, William Cartwright</u>
8:30-10:20	<b>T18-1 Relief representation</b> ..... <span style="color: red;">Mars (Miraikan)</span>
	Chair: Karel Kriz (University of Vienna)
	<b>T18-1-1</b> <b>Standard Elevation Models for Evaluating Terrain Representation</b> <u>Patrick Kennelly, Tom Patterson, Alexander Tait, Bernhard Jenny, Daniel Huffman, Sarah Bell, Brooke Marston</u>

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- T18-1-2** Analysis of Relief Shading Tools and Methods for Terrain Representation  
Marianna Farmakis-Serebryakova, Lorenz Hurniight

- T18-1-3** Contour Lines Generation in Karstic Plateaus for Topographic Maps  
Guillaume Touya, Hugo Boulze, Anouk Schleich, Hervé Quinqueuvel

- T18-1-4** Visualizations of the Doblar Accumulation Basin Based on the UAV Survey  
Klemen Kozmus Trajkovski, Gašper Štibe, Dušan Petrovič

8:30-10:20 **T19-1 Open source geotechnologies in Cartography** ..... Mercury (Miraikan)  
 Chair: Claudia Robbi Sluter (Federal University of Rio Grande do Sul - UFRGS (Brazil))

- T19-1-1** The advancement of utilizing geospatial information via GSI Maps  
Hirosato Mogi

- T19-1-2** GIS Maps as Powerful Curriculum Artefacts  
Mary Fargher

- T19-1-3** Historical map viewer technology that guarantees nonlinear bijective conversion without distortion  
Kohei Otsuka

- T19-1-4** Reproducible Workflow for Cartography - Migrants Deaths in the Mediterranean sea  
Timothée Giraud, Nicolas Lambert

9:20-10:20 **Asia-5 Second Asia GIS Keynote** ..... Conference Room 4+5 (Plaza Heisei)  
 Chair: Jianya GONG (Wuhan University)

- Asia-5-1** Scaling Geospatial Analysis for SDGs with Space Infrastructure  
Ryosuke Shibasaki (The University of Tokyo)

9:20-10:20 **T26-1 User Issues in Representation Design I** ..... Conference Room 2 (Plaza Heisei)  
 Chair: Robert Roth (University of Wisconsin)

- T26-1-1** How does the enumeration unit size influence spatial pattern recognition in choropleth maps?  
 User study  
Izabela Karsznia

- T26-1-2** Choropleth map - which data type should I use?  
Tomasz Nowacki

9:20-10:20 **T42-1 Geospatial web data** ..... Conference Room 3 (Plaza Heisei)  
 Chair: Hideyuki Fujita (The University of Electro-Communications)

- T42-1-1** Research on Deep Web POI Acquisition based on Retrieving Word Optimization and Spatial Adaption  
Yong Wang, Jiping Liu, An Luo, Yuanhui Cao

- T42-1-2** Analysis of Tourists' Image of Seoul with Geotagged Photos using Convolutional Neural Networks  
Dongeun Kim, Youngok Kang, Yearim Park, Nayeon Kim, Juyoon Lee, Nahye Cho

- T42-1-3** Semantic trajectory inference from geo-tagged tweets  
Qunying Huang, Xinyi Liu

10:50-12:10 **Asia-6 Mapping and GIS in Asia III** ..... Conference Room 4+5 (Plaza Heisei)  
 Chair: Qiming ZHOU (Hong Kong Baptist University)

- Asia-6-1** Formal Analysis and Optimized Visual Design of Graticule  
Yifan Chen, Feiran Sun, Junfan Jiang

- Asia-6-2** Geographic Knowledge Graph Embedding with Geospatial Features  
Peiyuan Qiu, Feng Lu, Li Yu, Jialiang Gao, Shengjie Zheng

- Asia-6-3** Wind impact visualization and analysis for Typhoon during 2008-2017 in Shenzhen, south China  
Jun Liu, Qiming Zhou

- Asia-6-4** An Estimation of Housing Vacancy Rate in China Using NPP- VIIRS Nighttime Light Data and OpenStreetMap Data  
Luyao Wang, Hong Fan

10:50-12:10 **T02-6 Educational and Ecological Atlases** ..... Innovation Hall (Miraikan)  
 Chair: Vit Vozenilek (Palacký University Olomouc)

- T02-6-1** The Republic of Indonesia Territorial Atlas as Geoliteration Tools for the Adolescents  
Fakhruddin Mustofa, Ellen Suryanegara, Niendyawati Niendyawati, Mulyanto Darmawan

- T02-6-2** Swiss World Atlas in Class Room - How to teach with maps  
Wenke Zimmermann, Lorenz Hurni

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- T02-6-3** Rethinking the Place of students intermediated by the Geographic, Historical and Cultural School Atlas of the Federal District, Brasília, Brazil  
Vânia L.C.A. Souza, Cristina M.C. Leite, Míriam A. Bueno

- T02-6-4** Fauna on the maps of Russia and its Arctic Region  
Tamara Vereshchaka, Olga Kulagina, A.L. Stepanchenko

- 10:50-12:10 **T07-2 Educational concepts** ..... **Venus (Miraikan)**  
 Chair: Gertrud Schaab (Deputy Dean for Research, Karlsruhe University of Applied Research, Germany)

- T07-2-1** Strategies for teaching cartography from theory and practice  
Jeff T Howarth

- T07-2-2** Contemporary challenges in cartographic education  
David Fairbairn

- T07-2-3** Envisioning the future of academic cartographic education  
Georg Gartner, Menno-Jan Kraak, Dirk Burghardt, Ligu Meng, Juliane Cron, Corne Van Elzakker, Britta Ricker

- T07-2-4** ANALYTICAL BACKGROUND FOR DEVELOPING A BODY OF KNOWLEDGE FOR CARTOGRAPHY  
Harold Moellering

- 10:50-12:10 **T09-4 Network Analysis (I)** ..... **Miraikan Hall (Miraikan)**  
 Chair: Clio Andris (Georgia Institute of Technology)

- T09-4-1** Understanding the integration of buses and metro systems using smart card data  
Diao Lin, Ruoxin Zhu

- T09-4-2** Uncovering Community Structure in Geospatial Networks: A Case Study of Urban Bus Networks in Hangzhou, China  
Yujing Wang, Fu Ren, Qingyun Du

- T09-4-3** Shadow analysis of buildings over urban express way by using three-dimensional GIS - To study the distribution of long remained snow cover that made express way close for five days  
Daichi Shiroki, Hiroshi Masaharu

- T09-4-4** FINDING AN ALTERNATE ACCESS ROUTE FROM IKIRE TO GBONGAN USING GEOSPATIAL TECHNIQUES  
Nureni Babatunde Amoo

- 10:50-12:10 **T13-2 Map Design II: Flows and Schematics** ..... **Uranus (Miraikan)**  
 Chair: Kenneth Field (Esri Inc.)

- T13-2-1** Design, Dissemination, and Disinformation in Viral Maps  
Anthony C Robinson

- T13-2-2** Emotion maps  
William Edward Cartwright

- T13-2-3** User Preferences for Bus Map Design: Evidence from a Map Usability Study  
Mohd Shahmy Mohd Said, David Forrest

- 10:50-12:10 **T18-2 Mapping mountain and outdoor activities** ..... **Mars (Miraikan)**  
 Chair: Dušan Petrovič (University of Ljubljana)

- T18-2-1** ALBINA The White Goddess – Mapping and Communicating Avalanche Risk in the European Alps  
Karel Kriz

- T18-2-2** Proposals for enhancements of topographic maps for high alpine tours  
Stephan Wondrak

- T18-2-3** Cross-border topographic mapping, cross-border orienteering: the Hungarian overview  
László Zentai, Gábor Gercsák

- 10:50-12:10 **T26-2 User Issues in Representation Design II** ..... **Conference Room 2 (Plaza Heisei)**  
 Chair: Zdenek Stachon (Masaryk University)

- T26-2-1** Evaluating rainbow colour scheme in social data mapping  
Izabela Golebiowska

- T26-2-2** How colour palettes in maps are re-coloured by daltonization methods  
Anne Kristin Kvitle

- T26-2-3** Numbers on maps as a new cartographic technique: helpful or harmful for users? An empirical study  
Jolanta Korycka-Skorupa

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- T26-2-4** **The Specifics of Cartographic Semiology in Tactile Maps**  
Alena Vondrakova, Radek Barvir, Jan Brus

- 10:50-12:10 **T30-1 GIS, Remote Sensing and Cartographic Theory, Methodology and Applications (1)** ..... **Saturn (Miraikan)**

Chair: Takashi Oguchi and Tzai-Hung Wen (Univ. Tokyo, Japan, National Taiwan Univ.)

- T30-1-1** Extraction of knowledge on spatial distribution and spatial relationship from scanned topographic map using Convolutional Neural Networks  
Hao Wu, Hongguo Jia

- T30-1-2** Semantically Enriched Simplification of Trajectories  
Rajesh Tamilmani, Emmanuel Stefanakis

- T30-1-3** Third dimension of a map  
Karel Jedlička

- T30-1-4** Image Spectrometry and Copernicus data for Heritage Mapping in the Jarama Valley, Spain  
Juan Gregorio Rejas, Francisco Javier Gonzalez, Pilar Sanchez-Ortiz

- 10:50-12:10 **T31-1 Visualization and Analysis of Geographical Process (1)** ..... **Mercury (Miraikan)**

Chair: Koichi Tanaka (Ibaraki University)

- T31-1-1** Time-space Visualization of Automobile and Airplane Travel Time from Chicago to Various Destination Cities  
Stella W. Todd, Alex Yetsko, Claire Hay

- T31-1-2** An Analysis of Movement by Visualizing Spatio-Temporal Characteristics of Logdata  
Nahye Cho, Youngok Kang

- 10:50-12:10 **T34/35-3 Analysis of OpenStreetMap contribution and data trustworthiness** ..... **Conference Room 1 (Plaza Heisei)**

Chair: Maria Antonia Brovelli (Politecnico di Milano)

- T34/35-3-1** Temporal-spatial Analysis of Contributors' Mapping Behavior for Building Data in OpenStreetMap  
Jin Xu, Qi Zhou

- T34/35-3-2** Spatial-temporal Evolution and Completeness Analysis of OpenStreetMap Building Data in China from 2012 to 2017  
Qi Zhou, Yuanjian Tian

- T34/35-3-3** Pedestrian Traffic Flow Prediction based on ANN Model and OSM data  
Achituv Cohen, Sagi Dalyot

- T34/35-3-4** Integrating spatial accessibility estimates derived from crowdsourced, commercial, and authoritative geo-datasets: Case study of mapping accessibility to urban green space in the Tokyo-Yokohama area  
Brian Alan Johnson, Rajarshi Dasgupta, Shizuka Hashimoto, Pankaj Kumar, Akio Onishi

- 10:50-12:10 **T42-2 Designing data driven maps** ..... **Conference Room 3 (Plaza Heisei)**

Chair: Tomas Reznik (Masaryk University)

- T42-2-1** Designing maps with fictional and real road intersections for the evaluation of countdown timer displays for bicyclists  
Andreas Keler, Georgios Grigoropoulos, Heather Kath, Klaus Krämer, Jakob Kath, Matthias Spangler, Fritz Busch

- T42-2-2** Enriching complex road intersections from OSM with traffic-related behavioral information  
Andreas Keler, Georgios Grigoropoulos, Dominik Mussack

- T42-2-3** Automatic Generation of Photorealistic Image Fillers for Privacy Enabled Urban Basemaps using Generative Adversarial Networks  
Amgad Agoub, Yevgeniya Filippovska, Valentina Schmidt, Martin Kada  
Andreas Keler, Georgios Grigoropoulos, Dominik Mussack

- T42-2-4** Innovative Geospatial and Cartographic Approaches to Identification, Analysis, and Visualisation of Land Degradation  
Tomas Reznik, Milan Konecny, Karel Charvat

- 13:30-14:30 **Keynote Presentation 2** ..... **International Conference Hall (Plaza Heisei)**  
Steve Coast

# Wednesday, July 17

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14:50-16:10 **Asia-7 Mapping and GIS in Asia IV** ..... Conference Room 4+5 (Plaza Heisei)  
 Chair: Ryosuke Shibasaki (The University of Tokyo)

- Asia-7-1** Automatic recognition of syntactic patterns of natural language spatial relations based on random forest machine learning algorithm  
Hong Fan, Dan Guo, Jian Ouyang
- Asia-7-2** Urban Informatics, a Attempt in the Big Data Era  
Yang Yue, Qingquan Li, Renzhong Guo
- Asia-7-3** A Cloud Model based Landslide Risk Level Assesment method  
Jing Geng, Wenxia Gan, Haning Yuan, Jiakai Yang
- Asia-7-4** What are the Focuses in GIS for the Last 10 Years ?: Extracting Key-phrases from Scientific Articles  
Li Yu, Feng Lu, Caihong Deng, Zhipeng Dong

14:50-16:10 **T06-4 Map design, emotions and decision-making** ..... Conference Room 2 (Plaza Heisei)  
 Chair: Amy Griffin (RMIT University)

- T06-4-1** The significance of shape in cartographic communication  
Silvia Klettner
- T06-4-2** Effects of valence on selecting and memorizing spatial information from road maps  
Andrea Binn
- T06-4-3** Emotional responses to climate change map framing using facial emotion recognition technology  
Carolyn S Fish, Amy L Griffin
- T06-4-4** How are map-based decisions influenced by uncertainty visualization in risky and time-critical situations?  
Michelle Korporaal, Sara Irina Fabrikant

14:50-16:10 **T07-3 Cartgraphic topics for wider audiences** ..... Venus (Miraikan)  
 Chair: William Cartwright (Professor of Cartography, RMIT University, Australia)

- T07-3-1** Geospatial Literacy in Africa-Nigeria  
Raimi Abidemi Asiyambola
- T07-3-2** Digital sketch maps in teaching GIS for law enforcement students  
Andrea Pódör, László Zentai, Erika Gál
- T07-3-3** Orienteering in Geography Education in Japanese High School  
Taketo Kobayashi
- T07-3-4** Challenges for First Time GIS User among Student Teachers  
Mengieng Ung

14:50-16:10 **T09-5 Network Analysis (II)** ..... Miraikan Hall (Miraikan)  
 Chair: X.Angela Yao (University of Georgia)

- T09-5-1** MODELING AND ANALYSIS OF SEMANTICALLY ENRICHED SIMPLIFIED TRAJECTORIES USING GRAPH DATABASES  
Rajesh Tamilmani, Emmanuel Stefanakis
- T09-5-2** Data Cleansing Method for Sparse Trajectory Data: A Case Study of Shared Electric Bicycles in Tengzhou  
Zhaoxin Dai, Weixiang Peng, Chengcheng Zhang
- T09-5-3** Analysis on the Riding Characteristics of Mobike Sharing Bicycle in Beijing City, China  
Min Cao, Mengxue Huang
- T09-5-4** An Improved Algorithms of Stroke Generation Considering Multi-level Information Quantity  
Liu Yi, Li Wen Jing, Lin Zhi Yong

14:50-16:10 **T13-3 Map Design III: Thematics** ..... Uranus (Miraikan)  
 Chair: Ian Muehlenhaus (University of Wisconsin-Madison)

- T13-3-1** Image of Excellence – Developing Wine Maps for Austria  
Karel Kriz
- T13-3-2** Thematic Mapping: This Is My Truth Tell Me Yours  
Kenneth Field
- T13-3-3** Central Park Squirrel Census Maps  
Nathaniel Garnett Slaughter Iv

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- 14:50-16:10 **T23-1 New Approaches in Topographic Mapping** ..... Mars (Miraikan)  
 Chair: Alexander Kent (Canterbury Christ Church University)
- T23-1-1** Towards sustainable topographic mapping  
Haico Van Der Vegt, Paula Dijkstra, Ton Van Helvert
  - T23-1-2** Cartographic support of design, construction and operation of underground gas storage in rock salt  
Tamara Vereshchaka, Marina Bakanova, A.L. Stepanchenko
  - T23-1-3** Digital processing of old topographical maps for the reference base for quantitative and qualitative studies of landscape changes  
Dariusz Lorek, Beata Medyńska-Gulij, Paweł Cybulski, Tymoteusz Horbiński
  - T23-1-4** DEM based Terrain Sketch Mapping in a Loess Landform By Considering visual hierarchy and feature generalization  
Cheng Yi Han
- 14:50-16:10 **T30-2 GIS, Remote Sensing and Cartographic Theory, Methodology and Applications (2)** ..... Saturn (Miraikan)  
 Chair: Takashi Oguchi and Tzai-Hung Wen (Univ. Tokyo, Japan, National Taiwan Univ.)
- T30-2-1** 3D Map Visualization Process and Efficiency Analysis of Geographic Information Based on WebGL  
Deguo Su, Beibei Tan, Debao Yuan, Yong Wang
  - T30-2-2** Displacement and visualization of point symbols based on spatial distribution characteristics  
Haipeng Liu, Yi Long, Yi Zheng
  - T30-2-3** Improvements to Information Entropy for Raster Spatial Data: A Thermodynamic-based Evaluation  
Hong Zhang, Peichao Gao, Zhilin Li
  - T30-2-4** Boltzmann Entropy for the Spatial Information of Raster Data  
Peichao Gao, Hong Zhang, Zhilin Li
- 14:50-16:10 **T31-2 Visualization and Analysis of Geographical Process (2)** ..... Mercury (Miraikan)  
 Chair: Manjula Ranagalage (Rajarata University Sli Lanka)
- T31-2-1** The Spatial Relationship between Land Surface Temperature and Land Use/Cover Types in Sapporo City, Japan  
Ruci Wang, Yuji Murayama
  - T31-2-2** Evaluating Bi-temporal Dynamics and Trend of Urbanization-induced Land Cover Temperature in Shanghai, China  
Fei Liu, Yuji Murayama
  - T31-2-3** Geographical Change of the Japanese National Land in the 200 Years Using INÔ's Map with GIS  
Yuji Murayama, Yuki Iwai
- 14:50-16:10 **T34/35-4 Geomedia studies using volunteered geographic information** ..... Conference Room 1 (Plaza Heisei)  
 Chair: Holger Jens Kumke (Technical University Munich)
- T34/35-4-1** Linking picture with text: tagging flood relevant tweets for rapid flood inundation mapping  
Xiao Huang, Cuizhen Wang, Zhenlong Li
  - T34/35-4-2** Social Media for Sensing: Do Tweets Represent Events at Geo-Tagged Locations?  
Morteza Karimzadeh
  - T34/35-4-3** Finding cultural heritage traces from modern social media  
Francisco Porras Bernardez, Georg Gartner, Nico Van De Weghe, Steven Verstockt
- 14:50-16:10 **T39-1 Theoretical Cartography 1** ..... Innovation Hall (Miraikan)  
 Chair: Georg Gartner (Technical University Vienna)
- T39-1-1** Functional Cartography – About the quality of maps from the era of artefacts to the era of services and beyond  
Georg Gartner
  - T39-1-2** Mapping in Cartography  
Miljenko Lapaine
  - T39-1-3** From third-person to first-person cartographies with immersive virtual environments  
Florian Hruby

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- 14:50-16:10 **T42-3 Sensing and data analysis** ..... Conference Room 3 (Plaza Heisei)  
 Chair: Akira Sasagawa (Geospatial Information Authority of Japan)
- T42-3-1** Analysis of Travel Patterns of Seoul Tourists by Trajectory Data Mining  
Juyoon Lee, Youngok Kang, Nayeon Kim, Dongeun Kim, Yearim Park
  - T42-3-2** Air pollution potential hot zone evaluation model based on environmental sensing IoT  
Chi-Chieh Peng, Tzai-Hung Wen
  - T42-3-3** Exploring Urban Dynamics from Bluetooth Tracking Data: A Case Study of Austin, Texas  
Yihong Yuan, David Mills
  - T42-3-4** Extraction of Newly-built Roads Using Probe Data  
Shuto Sugai, Sho Takahashi, Mayumi Noguchi, Akira Sasagawa
- 16:40-18:00 **T06-5 Optimizing map design for end users** ..... Conference Room 2 (Plaza Heisei)  
 Chair: Sidonie Christophe (Institut Nationale Géographique)
- T06-5-1** Coincident Visualization of Uncertainty and Value for Point Symbols  
Petr Kubiček, Milan Konečný, Jie Shen, Zdeněk Stachoň, Xinqian Wu
  - T06-5-2** Grid overlays reduce bias in mental representations of topographic maps  
Lars Kuchinke, Julian Keil, Dennis Edler, Anne-Kathrin Bestgen, Frank Dickmann
  - T06-5-3** Using Area Cartograms in Teaching Geography in Secondary Schools  
Anna Markowska
  - T06-5-4** Creating and evaluating web-based visualizations of multi-dimensional spatiotemporal data  
Jan Wilkenning, Kuni Han, Mathias Jahnke
- 16:40-18:00 **T07-4 Cartographic education supporting specific activities** ... Venus (Miraikan)  
 Chair: Tao Wang (Associate Dean for Education and International Affairs, Capital Normal University, Beijing, China)
- T07-4-1** Educational resources of Cartography and Geography in the IGN of Spain  
Ana Velasco-Tirado, Celia Sevilla-Sánchez
  - T07-4-2** NOAA's Certification program in Marine Cartography  
Shachak Peeri, John Nyberg, Neil Weston
  - T07-4-3** International Cartography Master graduates starting their career  
Juliane Cron, Liqui Meng, Edyta Bogucka, Georg Gartner, Dirk Burghardt, Menno-Jan Kraak, Corné Van Elzakker, Britta Ricker
- 16:40-18:00 **T09-6 Analysis and modeling of air quality and landscape** ... Miraikan Hall (Miraikan)  
 Chair: Lei Zou (Texas A&M University)
- T09-6-1** Data-driven regionalization for analyzing the spatiotemporal characteristic of air quality in China  
Sheng Li, Jiangtao Liu, Chao Wu
  - T09-6-2** Extracting relationship between air pollution and precipitation using spatio-temporal analysis in Tehran metropolis  
Shokouh Dareshiri, Mohammadreza Sahelgozin, Maryam Lotfian, Jens Ingensand
  - T09-6-3** Scale Effects on Land Loss Modeling in the Mississippi River Delta  
Nina S.-N. Lam, Heng Cai, Lei Zou, Kam-Biu Liu
- 16:40-18:00 **T13-4 Map Design IV: Content** ..... Uranus (Miraikan)  
 Chair: Kenneth Field (Esri Inc)
- T13-4-1** Banal Cartography: A Critique of Quantitative Content Analysis in Contemporary Cartographic Research  
Ian Muehlenhaus
  - T13-4-2** Ten Telltale Signs of Novice Cartography  
Aileen R. Buckley
  - T13-4-3** Quantifying Emotion: Survey Methods and Sentiment Analysis in Cartographic Design Research  
Cary Leonard Anderson
- 16:40-18:00 **T23-2 Topographic Mapping of Urban Environments** ..... Mars (Miraikan)  
 Chair: Anja Hopfstock (Federal Agency for Geodesy and Cartography)
- T23-2-1** Analysing the Symbolology of Soviet Military City Plans  
Martin Davis, Alexander J Kent
  - T23-2-2** The Soviet Military Plan of Tokyo (1966)  
Alexander James Kent

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- T23-2-3** A proposal of topographic map symbols for large-scale maps of urban areas in Brazil  
Claudia Robbi Sluter, Silvana Philippi Camboim, Andrea Lopes lescheck, Luciane Borges Pereira

- T23-2-4** Measuring user preferences in virtual reality (VR): 2D versus 3D urban geovisualizations of topographic data  
Alexander James Kent, Lukasz Halik

- 16:40-18:00 **T30-3 GIS, Remote Sensing and Cartographic Theory, Methodology and Applications (3)** ..... **Saturn (Miraikan)**

Chair: Tzai-Hung Wen and Takashi Oguchi (National Taiwan Univ., Univ. Tokyo, Japan)

- T30-3-1** Automatic Change Detection Based on Edge Information Using Two Different Types of Ortho Image  
Akira Sasagawa, Shuto Sugai, Mayumi Noguchi

- T30-3-2** A novel spatial recurrent neural network for hyperspectral imagery classification  
Andong Ma, Anthony M. Filippi

- T30-3-3** Application of Method for Calculating Sky View Factor Using Google Street View: Relation Between Sky View Factor and Physical Elements in Urban Space  
Shoko Nishio, Fumiko Ito

- T30-3-4** Practice of a GIS education program for junior and senior high school students  
Hiroyuki Yamauchi, Takashi Oguchi, Yasutaka Haneda

- 16:40-18:00 **T31-3 Visualization and Analysis of Geographical Process (3)** ... **Mercury (Miraikan)**

Chair: Yuji Murayama (University of Tsukuba), S.I.S. Subasinghe (University of Peradeniya)

- T31-3-1** Spatial Analysis of Urbanization in Major Asian and African Cities  
Manjula Ranagalage, Yuji Murayama

- T31-3-2** The Impact of landscape composition for urban heat island intensity in Addis Ababa City using Landsat data (1986-2016)  
Dmsib Dissanayake, Takehiro Morimoto, Yuji Murayama, Manjula Ranagalage

- T31-3-3** Ground Disasters Visual Representation Based on Multi-Field Geospatial Infographics Spectra in Mining Area  
Jin Zhang

- T31-3-4** Multiscale assessment of northern forest characteristics based on ultra-high resolution data  
Andrey A. Medvedev, Arseny V. Kudikov, Natalia O. Telnova, Olga V. Tutubalina, Elena I. Golubeva, Mihail V. Zimin

- 16:40-18:00 **T34/35-5 Development and practices of crowdsourced geospatial information** ... **Conference Room 1 (Plaza Heisei)**

Chair: Toshikazu Seto (The University of Tokyo)

- T34/35-5-1** Action, Emotion, Opinion – A Taxonomy of Human Reactions Expressed in Location-Based Social Media  
Eva Hauthal, Dirk Burghardt

- T34/35-5-2** Feedbacks on VGI in-situ campaign for updating LULC data  
Laurence Jolivet, Ana-Maria Olteanu-Raimond, Marie-Dominique Van Damme, Marie Gombert, Simon Fauret, Thierry Saffroy

- T34/35-5-3** The Development of Open Source Based Citizen Collaboration Applications for Infrastructure Management: My City Report  
Toshikazu Seto, Yoshihide Sekimoto, Hiroshi Omata, Hiroya Maeda, Takehiro Kashiyama, Shusaku Higashi, Masato Fujii, Haruyuki Seki

- 16:40-18:00 **T39-2 Theoretical Cartography 2** ..... **Innovation Hall (Miraikan)**

Chair: Jim Thatcher (University of Washington Tacoma)

- T39-2-1** Distance Matters: a more than euclidean approach to visualizing gerrymandering  
Austin Jennings, Jim Thatcher

- T39-2-2** A Choropleth Map Classification Scheme with Control of Robustness for Uncertain Geographical Attributes  
Wangshu Mu, Daoqin Tong

- T39-2-3** Automatic Geological Map Generalization for special geobody—A Case Study on Dyke  
Wenjing Li, Siyi Li, Hongguo Jia

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16:40-18:00 **T42-4 Geospatial big data visualization and Data science** ... Conference Room 3 (Plaza Heisei)  
Chair: Ryo Inoue (Tohoku University)

**T42-4-1** **Towards Spatial Data Science: Bridging the Gap between GIS, Cartography and Data Science**  
Jan Wilkenning

**T42-4-2** **comprehensive workflow for automating thematic map geovisualization from univariate big geospatial point data**  
Larissa Pillay, Gertrud Schaab, Serena Coetzee, Victoria Rautenbach

**T42-4-3** **Advanced Cartographic Techniques for Making Sense of Big Dynamic Data**  
Alexandre Sorokine, Steven Fernandez

**T42-4-4** **Ethics of Location-Based Data in Crisis Situations**  
Alan M Maceachren

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## Poster

8:30-18:00

- Poster Session P2 ..... Jupiter (Miraikan)**
- P2-01** **Geospatial Information Authority of Japan's (GSI's) support for geography education**  
Takaki Okatani, Hiroaki Tanaka, Yuki Kurisu, Hidetoshi Nakajima, Keisuke Katsuta
  - P2-02** **Work in Team – Improve your GIS Skills. Effectiveness of project work in teaching GIS for foreign students**  
Krisztina Irás, José Jesús Reyes Nunez
  - P2-03** **Geostatistical mapping of land prices in Taiwan Case: an empirical comparison of ordinary kriging**  
Cheng-Ya Chang
  - P2-04** **Estimation of building shape by block size**  
Masahiro Taima, Yasushi Asami, Kimihiko Hino
  - P2-05** **Spatiotemporal Analysis of Carpooling Data**  
Mátyás Gede, Lola Varga
  - P2-06** **Evaluating transport time in emergency medical service via GIS: an observational study of Tokyo**  
Tianqi Xia, Shuzhe Huang, Xuan Song, Xiaoya Song, Ruochen Si, Ryosuke Shibasaki, Kyoung-Sook Kim
  - P2-07** **Digital Terrain Representation Methods and Red Relief Image Map, A New Visualization Approach**  
Tatsuro Chiba, Shin-Ichi Kaneta, Makoto Ohashi
  - P2-08** **Improvement suggestions for problems of hazard map from the viewpoint of color scheme**  
Endo Ryo, Nakano Takayuki
  - P2-09** **Implementation of Pedestrian Path Navigation Algorithm Based on "We-Map" Platform**  
Jian Zhang, Haowen Yan
  - P2-10** **Potential of Digital Elevation Topographic Maps reveal the history of the region: comparing Those Maps with Marsh data in the early Meiji Period**  
Masatoshi Ideto, Yuki Kurisu, Hideyuki Toishigawa
  - P2-11** **The Magnificent Pilgrimage of Borobudur**  
Dirga Imam Gozali Sumantri, Muhammad Raihan, Pindi Setiawan, Agung Budi Harto
  - P2-12** **Methods and algorithms for creation of structural schemes of rivers**  
Ivan Evgenyevich Fokin, Sergey Anatolyevich Krylov
  - P2-13** **A precise location navigation map visualization method for landmark guidance**  
Wang Hai Ying, Yan haowen
  - P2-14** **Consideration of topographic expression for Geopark maps - Case study of the North Ibaraki Geopark**  
Mamoru Koarai, Rika Imaizumi
  - P2-15** **A New Method for Extracting Elevation Information of River System from Contours**  
Guifang He, Minshi Liu
  - P2-16** **Satellite Stereo Image Processing for 3D Topographic Mapping**  
Jaehong Oh, Changno Lee
  - P2-17** **Landform mapping of Okinoshima island and sea bed of Munakata city**  
Takahito Kuroki
  - P2-18** **Using a free colour vision simulator to improve the accessibility of orienteering maps**  
Rebecca Schulga, David Forrest, Trevor Hoey
  - P2-19** **Measuring distance through topographic models**  
Roberto De Figueiredo Ribeiro
  - P2-20** **Usability problems and literacy of online maps**  
Shin Murakoshi, Kenta Mitsushita
  - P2-21** **Study on the Behaviors of Inbound Tourists based on Geotagged Photo Metadata**  
Ru Ru Shen, Hao Wen Yan, Qin Ke Sun, Xiao Jun Li
  - P2-22** **Making post-glacial uplift visible: A model based high-resolution animation of shore displacement**  
Viljami Perheentupa, Ville Mäkinen, Juha Oksanen
  - P2-23** **UAV Based Agricultural Crop Canopy Mapping for Crop Field Monitoring**  
Prabath Priyankara, Takehiro Morimoto

# Wednesday, July 17

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- P2-24 Urban Growth: From pixel to reality**  
Shyamantha Subasinghe
- P2-25 Visualization and geospatial analysis on rural areas using sub-regional statistics**  
Takehiro Morimoto
- P2-26 Research on event perception based on geo-tagged social media data**  
Ruoxin Zhu, Chenyu Zuo, Diao Lin
- P2-27 Interactive mapping for geographically weighted correlation in big census data**  
Narumasa Tsutsumida, Joseph Percival, Daisuke Murakami, Takahiro Yoshida, Tomoki Nakaya
- P2-28 Applicability of KOMPSAT Image Data in Open Data Cube**  
Kwangseob Kim, Kiwon Lee
- P2-29 A city in liquid modernity: a sociological perspective**  
Edyta Baranska

# Thursday, July 18

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- 8:30-10:20 **T03-1 Cartographic Heritage 1: Georeferencing, Analysis** ..... **Mars (Miraikan)**  
 Chair: Angeliki Tsorlini (Aristotle University of Thessaloniki)
- T03-1-1** **Fast georeferencing/geocoding tool for old maps with large distortions**  
Mátyás Gede
  - T03-1-2** **Research on Geographical Positioning of Ancient Map**  
Lili Jiang
- 8:30-10:20 **T07-5 Cartographic topics for the classroom** ..... **Venus (Miraikan)**  
 Chair: David Fairbairn (Chair, ICA Commission on Education & Training, UK)
- T07-5-1** **Developing Interactive Map Apps for an Exhibition on the Topic 'Fremdsein': a Joint Endeavour by Students and Lecturers**  
Gertrud Schaab, Christian Stern, Jan Jedersberger, Agageldi Samedov
  - T07-5-2** **A New Approach to Teaching C++ Programming for Cartography Students by Means Training Programs with Emphasizing Cartography and Geodesy**  
Vladimir Zablotskii
  - T07-5-3** **Cartography. A book and a MOOC**  
Kenneth Field
  - T07-5-4** **Demystifying Least Square Adjustments Using Smartphones and Graphic Calculator**  
Roberto Magayanes Recamunda
- 8:30-10:20 **T09-7 Health and emergency analysis** ..... **Miraikan Hall (Miraikan)**  
 Chair: Lois A Park (University of Southern California)
- T09-7-1** **Identifying Heat Health Risks in the Urban Areas of Western Australia (WA) – An Enhanced Heat Vulnerability Assessment**  
Qian Sun, Grace Yun, Ting Ling
  - T09-7-2** **Subnational estimates of health in low- and middle-income countries: a geospatial approach with interpolation and raster analysis**  
Lois A Park
  - T09-7-3** **An approach for identifying and analysing reference features and spatial relations used in mountain emergency calls**  
Mattia Bunel, Cécile Duchêne, Ana-Maria Olteanu-Raimond, Marlène Villanova-Olivier, Grégoire Bonhoure, Tiphaine Jouan
- 8:30-10:20 **T13-5 Map Design V: Paths** ..... **Uranus (Miraikan)**  
 Chair: Ian Muehlenhaus (University of Wisconsin-Madison)
- T13-5-1** **Marathon Map and its Utilization in City Tourism**  
Xiaoyan Liu, Cheng Ye, Shuran Zhang
  - T13-5-2** **Indoor path visualization method based on the spatial characteristics of indoor environment**  
Jiafeng Shi, Jie Shen, Zdeněk Stachoň, Yawei Chen
- 8:30-10:20 **T21-1 Advances in SDI research** ..... **Saturn (Miraikan)**  
 Chair: Serena Coetzee (University of Pretoria)
- T21-1-1** **Harmonizing National Topographic Data Using an Automated Quality Validation Process**  
Nils Erik Mesterton, Mari Talvikki Isomäki, Antti Jakobsson, Joonas Jokela
  - T21-1-2** **MODEL OF MANAGEMENT OF THE QUALITY OF THE GEOSPATIAL INFORMATION IN THE AEROPHOTOGRAFETRIC SERVICE OF THE AIR FORCE OF CHILE, BASED ON STANDARDS ISO TC/211**  
Joselyn Robledo Ceballos
  - T21-1-3** **Collaborative Custodianship through Collaborative Cloud Mapping: Challenges and Opportunities**  
Serena Coetzee, Jacques Du Preez, Franz-Josef Behr, Antony K Cooper, Maritijn Odijk, Siegfried Vanlithout, Raf Buyle, Markus Jobst, Maroale Chauke, Nicolene Fourie, Peter Schmitz, Frikan Erwee
  - T21-1-4** **Expanding the ICA model of stakeholders in a spatial data infrastructure (SDI)**  
Antony Kyle Cooper, Serena Coetzee, Petr Rapant, Adam Iwanik, Jan Hjelmager, Harold Moellering, Michel Huet, Kisco Sinvula

# Thursday, July 18

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- 8:30-10:20 **T31-4 Visualization and Analysis of Geographical Process (4)** ..... Mercury (Miraikan)  
 Chair: Manjula Ranagalageoqua (Rajarata University of Sri Lanka)
- T31-4-1** Detecting Cooling Effect of Landscape Composition and Configuration: An Urban Heat Island Study on Hangzhou  
Hao Hou, Ronald Canero Estoque
  - T31-4-2** Individual level heat stress evaluation using GPS towards smart navigation system  
Takahiro Yoshida, Yoshiki Yamagata, Daisuke Murakami
  - T31-4-3** Visualization and Spatio-temporal Analysis of Tsunami Inundation: A Case of the Great East Japan Earthquake  
Yuki Iwai
  - T31-4-4** Long-term analysis of irrational water use processes based on cartographic materials and remote sensing data  
Andrey A. Medvedev, Natalia A. Alekseenko, Natalia O. Telnova, Alexander V. Koskharev
- 9:20-10:20 **T17-1 Maps and the Internet 1** ..... Conference Room 1 (Plaza Heisei)  
 Chair: Michael T Gastner (Yale-NUS College)
- T17-1-1** Pre-Pottery Neolithic age spatial planning: The typo-morphology of the first urbanisation with reference to three Akarçay Tepe plaques  
Sırrı Gülcen Eren
  - T17-1-2** The Application Programmer Interface (API) in Modern Cartography: Development and Prospects  
Michael P. Peterson
  - T17-1-3** go-cart.io: a web application for generating contiguous cartograms  
Shi Tingsheng, Ian K Duncan, Michael T Gastner
- 9:20-10:20 **T29-1 Space-time mapping for Digital Humanities** ..... Conference Room 4+5 (Plaza Heisei)  
 Chair: Nakaya Tomoki (Tohoku University)
- T29-1-1** Changes in the distribution and structure of white-collar workers' residences in Japan during the period of modernization  
Takashi Kirimura
  - T29-1-2** Space-Time Cube and Mixed Reality – New Approaches to Support Understanding Historical Landscape Changes  
Mathias Jahnke, Edyta Paulina Bogucka, Maria Turchenko
  - T29-1-3** Space-time mapping of historical plague epidemics in modern Osaka, Japan  
Tomoki Nakaya, Kazumasa Hanaoka, Shohei Nagata
- 10:50-12:10 **SS1 Cartography in the age of big data** ..... International Conference Hall (Plaza Heisei)  
 Chair: Keiji Yano (Ritsumeikan University)
- SS1-1** Cartography in the age of big data (Invited talk)  
James Cheshire (UCL)
- 10:50-12:10 **T03-2 Cartographic Heritage 2: Map Libraries** ..... Mars (Miraikan)  
 Chair: Mátyás Gede (ELTE Eötvös Loránd University, Budapest, Hungary)
- T03-2-1** Unlocking the Geospatial Past with Deep Learning – Establishing a Hub for Historical Map Data in Switzerland  
Magnus Heitzler, Lorenz Hurni
  - T03-2-2** Accessibility evaluation of topographic maps in the National Library of Poland  
Marta Kuzma, Albina Moscicka
  - T03-2-3** Documenting, organizing and demonstrating the cartographic wealth of a library, through an information system, to the public  
Angeliki Tsorlini
- 10:50-12:10 **T07-6 Educational approaches for cartography** ..... Venus (Miraikan)  
 Chair: Ferjan Ormeling (University of Amsterdam Library, Netherlands)
- T07-6-1** Cartographic Presentation as the Central Theme for Geospatial Education  
Rakesh Malhotra, Terry Mcneill, Carrie Francis, Timothy Mulrooney
  - T07-6-2** Teaching of geographical space relations for cartography - Academic Outdoor Station in Poznan (Poland)  
Beata Medyńska-Gulij, Maciej Smaczynski, Dariusz Lorek, Łukasz Halik, Łukasz Wielebski, Tymoteusz Horbinski, Paweł Cybulski
  - T07-6-3** New patterns for geography field practice education based on location services  
Ling Zhang, Qian Jia, Shaojun Liu, Ling Ruan, Yi Long

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- T07-6-4** A preliminary study of geographical names research: Review of cartography education & research in Indonesia  
Ari Cahyono, Hartono, Bowo Susilo, Niken Wirasanti

10:50-12:10 **T09-8 Geosimulation, Spatial data assessment and handling** ..... **Miraikan Hall (Miraikan)**  
 Chair: Bin Jiang (University of Gävle)

- T09-8-1** Using building types and demographic data to improve our understanding and use of urban sprawl simulation  
Mojtaba Eslahi, Rani El Meouche, Anne Ruas

- T09-8-2** Geospatial and Simulation a Point of Convergence  
Christopher Victor Budas

- T09-8-3** Spatial data quality in multi-criterial analysis for decision making process  
Vaclav Talhofer, Sárka Hošková-Mayerová

- T09-8-4** Calculate Accurate 3D Cost Distance Efficiently  
Yaqian Chen, Jiangfeng She, Xingong Li

10:50-12:10 **T13-6 Map Design VI: Production** ..... **Uranus (Miraikan)**  
 Chair: Kenneth Field (Esri inc)

- T13-6-1** Miura-ori, Basics for Designing its Folding Machines  
Koryo Miura

- T13-6-2** Designing the Imagery on Image Maps – How far can we take it?  
Christian E. Murphy

- T13-6-3** Efficiency of Cartographic production for Decision-making  
Christine Zanin

- T13-6-4** Developing and Evaluating Multi-Scale Map Styles: Creating a Multi-Scale Legend  
Mathias Gröbe, Dirk Burghardt

10:50-12:10 **T17-2 Maps and the Internet 2** ..... **Conference Room 1 (Plaza Heisei)**  
 Chair: Otakar Čerba (University of West Bohemia)

- T17-2-1** GSI Maps - Showcase of National Geospatial Data  
Kaito Kamimura

- T17-2-2** A context-driven geospatial web service approach towards the design of situational awareness maps  
Sin Yi Ho, Jung Hong Hong

- T17-2-3** Roles of Ontologies in Cartography  
Otakar Čerba

10:50-12:10 **T21-2 Standards for geospatial information** ..... **Saturn (Miraikan)**  
 Chair: Franz-Josef Behr (Stuttgart University of Applied Sciences)

- T21-2-1** Some Considerations to Improve the General Feature Model and General Portrayal Model in Gittock  
Morishige Ota

- T21-2-2** A Spanish Standard for defining Open Geographic Data  
Ana Velasco, Antonio F Rodríguez-Pascual, Celia Sevilla-Sánchez, Juan Manuel Rodríguez-Borreguero

- T21-2-3** Selected cartographic products of the Polish Geological Survey in light of the international data standards and OneGeology experience  
Katarzyna Jóźwik, Marcin Śłodkowski, Urszula Stępień

- T21-2-4** Study on multi-source data integrating standard and 3D cartographic visualization of urban flooding based on CityGML  
Jiemin Zhou, Jie Shen, Lukáš Herman, Yixian Du

10:50-12:10 **T26-3 User Issues in Interaction Design** ..... **Conference Room 2 (Plaza Heisei)**  
 Chair: Luciene Delazaro (Federal University of Parana)

- T26-3-1** Interacting with Maps in Virtual and Augmented Reality  
Bernhard Jenny, Kadek Ananta Satriadi, Yalong Yang, Christopher R. Austin, Simond Lee, Nian Chan, Maxime Cordeil, Barrett Ens

- T26-3-2** Does Interactivity increase map user's reasoning? A study with environmental map users  
Andre Luiz Alencar De Mendonça, Carina Coelho

- T26-3-3** Interactive & Multiscale Thematic Maps: A Preliminary Study  
Robert E Roth, Meghan Kelly, Nick Underwood, Nick Lally, Kristen Vincent, Carl Sack

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- 10:50-12:10 **T30-4 GIS, Remote Sensing and Cartographic Theory, Methodology and Applications (4)** ..... Innovation Hall (Miraikan)  
 Chair: Takashi Oguchi and Tzai-Hung Wen (Univ. Tokyo, Japan, National Taiwan Univ.)
- T30-4-1** Geomorphological mapping based on DEMs and GIS: A review  
Takashi Oguchi
  - T30-4-2** Toward high resolution mapping of patterned ground with vegetation in Spitsbergen using a UAV  
Jaeyong Lee, Takashi Oguchi
  - T30-4-3** Assess the impact of land use changes on erosion and sedimentation in Dak Uy reservoir  
Hoa Thi Viet Le, Lan Thi Huong Pham, Nguyet Minh Le
  - T30-4-4** Assessing the instability of Dong Nai River in Bien Hoa District using Bank Erosion Hazard Index (BEHI) and Remote Sensing and GIS  
Lan Thi Huong Pham, Nguyet Minh Le, Hoa Thi Viet Le
- 10:50-12:10 **T31-5 Visualization and Analysis of Geographical Process (5)** ... Mercury (Miraikan)  
 Chair: Hao Hou (Hangzhou Normal University)
- T31-5-1** Validity of using of GIS, SDI, Remote Sensing and Environmental factors for site selection of zones of coffee agriculture localization suitability modeling in Maraba sector, south province of Rwanda  
Jean Pierre Hitimana
  - T31-5-2** Regioviz: a new visualisation tool dedicated to regional comparisons  
Ysebaert Ronan, Guérois Marianne
  - T31-5-3** Mapping votes and representing power: Spatio-temporal and multiscalar analysis of electoral results in Tunisia between 2011 and 2018.  
Maher Ben Rebah
  - T31-5-4** Features of creating multi-time thematic animations of the Arctic environment pollution on the example of Novaya Zemlya  
Andrey A. Medvedev, Natalia A. Alekseenko, Maria Arsentyeva
- 10:50-12:10 **T33-1 Rethinking Bertin Method 1 (framework)** ..... Conference Room 3 (Plaza Heisei)  
 Chair: Anne-Lyse Renon (University of Renne 2), EHESS (LIAS UMR8178)
- T33-1-1** Graphic design and research in social sciences: Jacques Bertin and the Laboratoire de Graphique.  
Anne-Lyse Renon
  - T33-1-2** From Semiology of Graphics to Cultural Analytics: flaws in the mathematization of visible  
Anthony Masure
- 13:30-14:30 **Keynote Presentation 3** ..... International Conference Hall (Plaza Heisei)  
Ayako Kagawa
- 14:50-16:10 **T03-3 Cartographic heritage 3: Applications** ..... Mars (Miraikan)  
 Chair: Evangelos Livieratos (Aristotle University of Thessaloniki)
- T03-3-1** From historical cartography to historical mapping: digital edition of Gaul/Raczynski topographic map of Greater Poland (1807-1812)  
Tomasz Panecki
  - T03-3-2** 3D Model of Historical Vltava River Valley: Combination of Sources  
Jiri Cajthaml, Darina Kratochvilova, Tomas Janata
  - T03-3-3** Transformation of the landscape of pre-industrial space in the multimedia depiction  
Dariusz Lorek
  - T03-3-4** Automated summit spot height generation for modern topographic mapping  
Samantha T Arundel, Arthur Chan
- 14:50-16:10 **T09-9 Accessibility** ..... Miraikan Hall (Miraikan)  
 Chair: X. Angela Yao (University of Georgia)
- T09-9-1** A systematic evaluation of accessibility measures by the two-step floating catchment area (2SFCA) method  
Xiang Chen, Pengfei Jia
  - T09-9-2** Network-based Visualisation of Accessibility for a Public Transport System  
Andreas Keler, Lukas A. Bug, Jukka M. Krisp
  - T09-9-3** GIS-analysis of ground transport accessibility of fire stations at regional scale  
Ekaterina Sergeevna Podolskaia, Dmitriy Vladimirovich Ershov, Konstantin Aleksandrovich Kovgankov

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- 14:50-16:10 **T11-1 Near East & Islam Cartography** ..... **Saturn (Miraikan)**  
 Chair: Şirin Gülcen Eren (Süleyman Demirel University)
- T11-1-1** Kitab-ı Bahriye (Book of Navigation), Commemoration of the Pîrî Reis and Understand His World Map of 1513.  
Aytac Yurukcu
  - T11-1-2** Catalan Atlas of 1375 and Hormuz around 1300  
Vladimir Liscak
  - T11-1-3** Ancient Anatolian Grids  
Şirin Gülcen Eren
- 14:50-16:10 **T16-1 Maps for the Disabled** ..... **Mercury (Miraikan)**  
 Chair: Andrey A. Medvedev (Institute of Geography, Russian Academy of Sciences)
- T16-1-1** Testing Maps for Visually Impaired People in Kurdistan  
Ashna Abdulrahman Kareem
  - T16-1-2** Plain cartography - web maps for visually impaired and elderly people  
Juha Oksanen, Pyry Kettunen, Christian Koski
  - T16-1-3** Toward Accessible Hazard Mapping: Tactile Risk Maps and Disaster Preparedness  
Harrison Carlton Cole
- 14:50-16:10 **T17-3 Maps and the Internet 3** ..... **Conference Room 1 (Plaza Heisei)**  
 Chair: Hideyuki Fujita (The University of Electro-Communications)
- T17-3-1** Web Maps for Risk Communication: Assessing Availability of Online Disaster Maps on Government Web Sites in Indonesia  
Kartika Puspita Sari, Hidehiko Kanegae
  - T17-3-2** Multimedia Presentation of Spatial Journalistic Content  
Zeinab Torabi, Jan Wilkening, Juliane Cron
  - T17-3-3** Visualisation and analysis of multi-resolution raster geodatasets in the cloud  
Lassi Allan Lehto, Jaakko Kähkönen, Juha Oksanen, Tapani Sarjakoski
  - T17-3-4** Finding hotspots by location-direction-enabled photographs focusing on intersection of lines of sight  
Hideyuki Fujita, Shota Sagara, Tadashi Ohmori, Takahiko Shintani
- 14:50-16:10 **T26-4 Use Case Domain Analyses** ..... **Conference Room 2 (Plaza Heisei)**  
 Chair: Alena Vondrákova (Palacky University Olomouc)
- T26-4-1** Maps in Citizen Science: A Preliminary Analysis of their Use and User Issues  
Artemis Skarlatidou, Marcos Moreu
  - T26-4-2** Graphic design and placement of map tools in mobile map application  
Tymoteusz Horbiński, Beata Medyńska-Gulij, Paweł Cybulski
  - T26-4-3** Map Use in Transit Control Centers: Mapping geographic information flows  
Emily Domanico
  - T26-4-4** Testing geovisualisations for effective environmental engineering decision-making  
Jess Hepburn, David Fairbairn
- 14:50-16:10 **T28-1 Nautical Charting: Production and Content** ..... **Venus (Miraikan)**  
 Chair: Ron Furness (ICA Marine Cartography Chair)
- T28-1-1** Validation of the shoal-biased pattern of bathymetric information on nautical charts.  
Christos Kastrisios, Brian Calder, Giuseppe Masetti, Peter Holmberg
  - T28-1-2** History of Japan's chart production in 150 years  
Toru Kajimura
  - T28-1-3** Adding value to ENCs: Land features  
Shachak Pe'er, Noel Dyer
  - T28-1-4** Raster charting products in an ENC-first era  
Christie Ence, Shachak Pe'er, John Nyberg
- 14:50-16:10 **T29-2 Mapping the past** ..... **Conference Room 4+5 (Plaza Heisei)**  
 Chair: Akihiro Tsukamoto (Tokushima University)
- T29-2-1** Transformation of the Vltava Historical Riverine Landscape within the Modern Times  
Jiri Krejci, Jiri Cajthaml

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- T29-2-2** **Digital archiving the space and memory of Kyoto across space and time using GIS**  
Naomi Kawasumi, Hirotaka Sato, Shunpei Yamamoto, Keiji Yano
- T29-2-3** **Premodern City Layouts Drawn on Published Maps: A Comparative Analysis of Edo, Osaka, and Kyoto**  
Akihiro Tsukamoto
- 14:50-16:10 **T30-5 GIS, Remote Sensing and Cartographic Theory, Methodology and Applications (5)** ..... **Innovation Hall (Miraikan)**  
 Chair: Takashi Oguchi and Tzai-Hung Wen (Univ. Tokyo, Japan, National Taiwan Univ.)
- T30-5-1** **Landslide hazard zonation assessment using GIS analysis at the coastal area of Safi (Morocco)**  
El Bchari Fatima, Barbara Theilen Willige, H. Ait Malek
- T30-5-2** **Three-dimensional desktop morphometric models for the Arctic Ocean floor**  
Igor V. Florinsky, Sergei V. Filippov
- T30-5-3** **Sea ice kinematic features in the Arctic outflow region and their associations with Arctic Northeast Passage accessibility**  
Da Wei Gui, Xiao Ping Pang, Rui Bo Lei, Xi Zhao, Jia Wang
- T30-5-4** **Comparison of Leads Mapping in the Arctic Ocean Between Landsat and MODIS Ice Surface Temperature Products**  
Xiaoping Pang, Pei Fan, Xi Zhao, Qing Ji
- 14:50-16:10 **T33-2 Rethinking Bertin Method 2 (practice)** ..... **Conference Room 3 (Plaza Heisei)**  
 Chair: Francis Harvey (Leibniz Institute for Regional Geography)
- T33-2-1** **A dialectical approach to the systematic analysis of geovisual communication using Bertin's visual variables**  
Francis Harvey
- T33-2-2** **Reaffirmation of J. Bertin's Ordinal Matrix for business strategy decision– taking apart of visualized data on map and reconstruction by the Ordinal Matrix**  
Keiichi Ishida
- T33-2-3** **The design of useful graphics in Bertin's thought. A case study from the Urban Atlas of Jeddah.**  
Mohsen Dhibe, Abdulhamid Jamil, Ahmed Moharrem
- T33-2-4** **A practice of information processing by rearranging matrix of Jacques Bertin - application of diagram in environmental color workshop -**  
Qifan Huang, Akiyo Kobayashi
- 14:50-16:10 **T41-1 Maps and Games 1** ..... **Uranus (Miraikan)**  
 Chair: Tomoyasu Maruyama (Google LLC)
- T41-1-1** **How to Play with Maps**  
Ross Thorn
- T41-1-2** **How an augmented reality game (Pokémon GO) affected volunteer contributions to OpenStreetMap**  
Brian Alan Johnson
- T41-1-3** **Location Based Elements into Gaming Industry**  
Tomoyasu Maruyama
- 16:40-18:00 **T03-4 Cartographic Heritage 4: The Data Behind** ..... **Mars (Miraikan)**  
 Chair: Jiri Cajthaml (Czech Technical University in Prague)
- T03-4-1** **Description of Cartographic Heritage in Europeana Data Model**  
Albina Kinga Moscicka, Agnieszka Zwirowicz-Rutkowska
- T03-4-2** **A semi-automated workflow for processing historic aerial photography**  
Nathan Piekielek
- T03-4-3** **Visualizing and Linking Cartographic Resources across Discovery Environments**  
Kimberly Durante, Emily Prince
- T03-4-4** **GeoDataHub: Building centralised repository of authoritative cartographic and geospatial resources**  
Igor Drecki
- 16:40-18:00 **T09-10 Big Data and machine learning (I)** ..... **Miraikan Hall (Miraikan)**  
 Chair: Lei Zou (Texas A&M University)
- T09-10-1** **Analysing tourism movements along the Danube river based on geotagged Flickr photography**  
Mátyás Gede, Bálint Kádár

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- T09-10-2** Visualizing and Mining Social Media Data for Smart Emergency Management  
Lei Zou

- T09-10-3** Estimating the Crowd Size of a Rally by Crowdsourcing-Geocomputation  
T. Edwin Chow

- T09-10-4** Research on Monitoring Location Model Based on Geo-Video Semantics  
Dan Hu, Wenjing Li, Li Siyi

16:40-18:00 **T11-2 Eastern Europe & The Americas** ..... **Saturn (Miraikan)**  
Chair: John J. Swab (University of Kentucky)

- T11-2-1** From Coast to Coast: The Mapping of the Adriatic Sea by the Joint Forces of the Austro-Hungarian and Italian Hydrographic Offices  
Mirela Altic

- T11-2-2** Depiction of Line Features on Folded Maps on Example of Old Maps of the Vltava River  
Tomas Janata, Jiri Krejci

- T11-2-3** Jewish settlement plans in Bohemia from the first half of the 18th century  
Jiří Drozda, Šárka Steinová, Filip Paulus

- T11-2-4** Mapping a Nation: Daniel Carter Beard's Time as a Surveyor for the Sanborn Map Company  
John J. Swab

16:40-18:00 **T16-2 Technology and Multisensory Maps** ..... **Mercury (Miraikan)**  
Chair: Carla Cristina da Sena (Universidade Estadual Paulista (UNESP))

- T16-2-1** Tactile thematic maps for the territory of Russia:multivariate representation of geographic information  
Andrey A. Medvedev

- T16-2-2** TouchIt3D: Technology (not only) for Tactile Maps  
Radek Barvir, Alena Vondrakova, Jan Brus

- T16-2-3** Mobility routing optimization for physical accessibility and thermoregulation  
Jeffrey R Heuwinkel, Matthew T. Rice, Manzhu Yu, Kevin M. Curtin

16:40-18:00 **T17-4 Maps and the Internet 4** ..... **Conference Room 1 (Plaza Heisei)**  
Chair: Aileen R. Buckley (Esri, Inc.)

- T17-4-1** Functionality similarities of global web mapping services in the context of responsive map design  
Tymoteusz Horbiński, Paweł Cybulski

- T17-4-2** Cartographic storytelling: 150 years of Swiss Federal Population Census  
Olaf König

- T17-4-3** Using Internet Streamed Data for Sport Visualization  
Rex G Cammack, Paul Hunt

- T17-4-4** Sharing Collections of Historical Map Online  
Aileen R. Buckley

16:40-18:00 **T26-5 User Study Experimental Design Issues** ..... **Conference Room 2 (Plaza Heisei)**  
Chair: Artemis Skarlatidou (University College London)

- T26-5-1** A visual approach to creating multivariate geovisualization test data  
Thomas Lerch, Susanne Bleisch

- T26-5-2** A review of map types used in empirical research in cartography  
Katarzyna Słomska

- T26-5-3** A note on the Relationship between Spatial Recognition and Behavior while Walking in the City  
Kaori Ito, Yusuke Sakurai, Yuri Fujita, Andrew Burgess

- T26-5-4** Design of a cartographic eye tracking-EEG user experiment  
Merve Keskin, Kristien Ooms, Philippe De Maeyer, Ahmet Ozgur Dogru

16:40-18:00 **T29-3 Web and ICT for Digital Humanities** ..... **Conference Room 4+5 (Plaza Heisei)**  
Chair: Keiji Yano (Ritsumeikan University)

- T29-3-1** Defensive Architecture Mapping: a case study in the city of Curitiba, Paraná, Brasil  
Debora Raquel Faria, Claudia Robbi Sluter, Alessandro Filla Rosaneli, Silvana Philipp Camboin

- T29-3-2** Modern Archeological Mapping: Towards Immersive VR Use in Archeology  
Alisa A Pettitt, Sven Fuhrmann

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- T29-3-3** Mining multiple sources of historical data: The example of a standardized dataset of medieval monasteries and convents in France  
Adam Mertel, David Zbíral

- T29-3-4** Japanese Map Warper for Spatial Humanities: The Japanese old maps portal site  
Keiji Yano, Satoshi Imamura, Ryo Kamata

- 16:40-18:00 **T30-6 GIS, Remote Sensing and Cartographic Theory, Methodology and Applications (6)** ..... Innovation Hall (Miraikan)  
 Chair: Takashi Oguchi and Tzai-Hung Wen (Univ. Tokyo, Japan, National Taiwan Univ.)

- T30-6-1** Flash Flood Hazard Mapping Using Satellite Images and GIS Tools: A case study of the central High Atlas (Morocco).  
El Bchari Fatima Fatima, Barbara Theilen Willige, Abdellatif Souhel
- T30-6-2** Dynamics of lake area on the Qinghai-Tibet plateau from 2000 to 2015  
Xianghong Che, Min Feng, Jiping Liu, Yong Wang, Qing Sun
- T30-6-3** GIS-based approach for development of the “natural basis” for thematic mapping  
Vera Ryzhkova, Michael Korets, Irina Danilova

- 16:40-18:00 **T33-3 Rethinking Bertin Method 3 (symbology)** ..... Conference Room 3 (Plaza Heisei)  
 Chair: Takashi Morita (Hosei University)

- T33-3-1** Design Issues on Context Based Cartographic Communication using Extended Visual Variables  
Takashi Morita
- T33-3-2** When marks become graphics. Rediscovering a forgotten Bertin's fork ?  
Gilles Rouffineau
- T33-3-3** Effect of Frame Structure on Interpretation of Map Symbols  
Zhilin Li

- 16:40-18:00 **T41-2 Maps and Games 2** ..... Uranus (Miraikan)  
 Chair: Tomoyasu Maruyama (Google LLC)

- T41-2-1** Preparation of the Future with Minecraft® on Demand  
François Lecordix, Sivakavi Kumarasamy, Fernando Da Graca, Sofiane Kriat
- T41-2-2** Coupling a collaborative digital map and a dashboard: an optimal starting point for urban project learning in engineer training? The case of the serious game “Urb’Act”  
Nathalie Molines, Carine Henriot

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## Poster

- 8:30-18:00 **Poster Session P3** ..... **Jupiter (Miraikan)**
- P3-01** The Characteristics of Taiwan Persuasive Maps Made by Japanese  
Ching-Jen Kao
  - P3-02** Publication of maps and plans of Jewish settlement from the first half of the 18th century  
Jiří Drozda, Filip Paulus, Sárka Steinová, Ondřej Böhm
  - P3-03** Automatic Georeferencing of Heterogenous Historic and Illustrated Maps  
Enrique Javier Arriaga-Varela, Toru Takahashi
  - P3-04** Historical maps and landscape analysis  
Vladimir Kusan, Stjepan Husnjak, Tena Birov, Ivona Ziza
  - P3-05** Engraved footprints from the past. Retrieving cartographic geohistorical data from the Cassini  
Carte de France, 1750 - 1789  
Bertrand Dumenieu, Julien Chadeyron, Pascal Cristofoli, Julien Perret, Laurence Jolivet, Stéphane Baciocchi
  - P3-06** Digital archiving project of paper maps collected for the International Map Exhibition 1980 in  
Tokyo  
Hideki Kaji, Ken'ichi Tsuruoka, Ruochen Si, Min Lu, Masatoshi Arikawa, Takashi Oguchi
  - P3-07** Establishment of the inventory of the historic bridges analyzing the maps of Europe in the XIX.  
Century, in the area of Split-Dalmatia County, Croatia  
Katarina Rogulj, Ivana Racetin, Jelena Kilić, Ljerka Županović
  - P3-08** 100 years of Carte Rouge – a Hungarian ethnographical map by Pál Teleki  
Daniel Zoltan Segyevy
  - P3-09** Use of 19th century cartographic source materials to study spatial changes of villages in  
Wielkopolska (Poland)  
Anna Oliskiewicz Krzywicka
  - P3-10** A history of the city written in a map – cartography as the mirror of socio-political events in  
Gdańsk in the years of 1918-1939  
Agnieszka Bień
  - P3-11** Exploring the social position of tactile maps in Japan  
Masahiro Tanaka
  - P3-12** Mind maps produced by visual impaired students  
Luciana Arruda, Carla Cristina Sena
  - P3-13** Caveat Emptor: A new form of participatory mapping and its ethical implications for Participatory  
GIS  
Koshiro Suzuki
  - P3-14** Interactive web mapping of 90 Years of Fire History Across South Australia  
Joshua Andrew Gore, Stefan Peters
  - P3-15** A Report on “Old Map Collection” by Geospatial Information Authority of Japan  
Kana Hidari, Niina Nakano
  - P3-16** Fuzzy Expression of Hand-drawn Paths in We-Map Environment  
Ru Ru Shen, Hao Wen Yan, Xiao Min Lu, Qin Ke Sun
  - P3-17** Mapping Mars's Eastern Valles Marineris  
Eian Scott Ray
  - P3-18** Geo-visualization of antibiotic resistance based on web map service  
Taekeon Hwang, Kangmin Kim, Chul Sue Hwang, Chang-Jun Cha
  - P3-19** The Re-Scheme Project for the Mexican Cartography Plan  
Cecilia Zuleima Cortina, Leonardo Tun, Shachak Pe'eri
  - P3-20** Seafloor Stereo Map of Coastal Areas for Geomorphological Studies  
Hideaki Goto
  - P3-21** The GEBCO and NOAA Chart Adequacy Workshop  
Cecilia Cortina, Rochelle Wigley, Shachak Pe'eri
  - P3-22** Geographically weighted bidimensional regression on the 17th-century map of a castle town in  
Japan  
Naoto Yabe

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- P3-23 Streetcar Passenger Flow Maps in Old Tokyo City in 1930  
Kazuki Ishikawa, Daichi Nakayama
- P3-24 Creation and analysis of a GIS land-use map for the end of the Edo period in Tokyo  
Takeshi Noma
- P3-25 Learning Method that Facilitates User Understanding of Changes in the Kyoto Townscape: Utilizing a Smartphone Application with the Kyoto City Tram and Bus Photograph Database  
Akira Takahashi, Shumpei Yamamoto, Hirotaka Sato, Naomi Kawasumi, Manabu Inoue, Keiji Yano, Asanobu Kitamoto
- P3-26 Assessment of the effectiveness of vegetation cover management in the Mediterranean region: a remote sensing mapping comparison. Example of El Kala National Park, Algeria  
Imene Diaf
- P3-27 Key Technology Research on Quality Inspection and Evaluation of Orthoimage Map Used in China's National Survey  
Yaoling Shang, Zhao Yousong, Ma Wei, Wu Xuan, Wang Jindong, Luo Fujun, Yan Qingaing, Xu Yongru
- P3-28 Static Risk Mapping of Forest Fires - In the case of the Province of Chefchaouen (Morocco)  
Malak Alasl
- P3-29 Mapping of Geospatial Information on Disasters Predicted to Occur in Wetland Areas of the Shonan Region  
Kuniaki Isobe, Toshiro Sugimura
- P3-30 New Authentication Method for Vector Geographic Data Based on Perceptual Hash  
Zhang Liming, Zhang Xingang
- P3-31 Deformation Monitoring of Landslide Based on Adapted Distributed Scatter Interferometric Synthetic Aperture Radar  
Hongguo Jia, Hao Zhang, Wenjing Ren, Bin Yan
- P3-32 The GIS-based approach for the permafrost active layer depth mapping  
Mikhail A. Korets, Anatoly S. Prokushkin
- P3-33 Analysing and visualizing spatio-temporal landslide patterns  
Daniel Hölbling, Raphael Spiekermann, Andrea Binn, Harley Betts
- P3-34 Simulation and prediction of Shanghai urban spatial change based on random forest and CA-Markov model  
Xuewei Dang, Liang Zhou, Xiaoen Li, Haowei Mu, Lei Che, Fuwei Qiao
- P3-35 Spatial differences and pattern evolution of Multi-scale Urban Land between China and India  
Qinke Sun, Liang Zhou, Xuewei Dang, Bowei Hu, Haowei Mu
- P3-36 Relationships between landslides and land use changes in the Sanbagawa and Mikabo Belts, Shikoku, Japan  
Roxanne Lai, Takashi Oguchi
- P3-37 Ecological Change Analysis of Lanzhou City Based on Remote Sensing Ecological Index  
Huang Yu Han, Yan Hao Wen
- P3-38 Robustness assessment of China's high-speed railway transportation network  
Zhuo Wang, Haowen Yan, Yuhan Huang, Yazhen Li
- P3-39 Ponds of landuse in Yangmei District and Pingzhen District, Taoyuan City, Taiwan  
Tzu Hui Lin
- P3-40 Simulating impact of over-grazing on grassland degradation using GIS: a case study in the Heihe River Basin, China  
Bingyu Wang, Takashi Oguchi, Lin Zhang
- P3-41 Spatial Patterns of Urban Expansion in Chinese Cities  
Jing Yao, Ya Ping Wang, Xiaoxiang Zhang
- P3-42 Disaster risk assessment for urban areas: A GIS flood risk analysis for Luján City (Argentina).  
Ignacio Agustín Gatti, Takashi Oguchi
- P3-43 Geomorphological analysis of wetland distribution on various spatial scales  
Natsuki Sasaki, Toshihiko Sugai
- P3-44 Analysis of children's future map drawings in Sapporo City  
Akio Shiino

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- 8:30-10:20 **T08-1 Generalization Processes** ..... **Uranus (Miraikan)**  
 Chair: Anne Ruas (IFSTTAR, France)
- T08-1-1** Is Deep Learning the New Agent for Map Generalization?  
Guillaume Touya, Xiang Zhang, Imran Lokhat
  - T08-1-2** Application of Deep Learning for 3D building generalization  
Yue Wu, Yevgeniya Filippovska, Valentina Schmidt, Martin Kada
  - T08-1-3** Automatic Selection Method of Urban Road Network Considering Structural Characteristics  
Wei Wu, Zhaotong Ma
- 8:30-10:20 **T09-11 Big Data and machine learning (II)** ..... **Miraikan Hall (Miraikan)**  
 Chair: Bin Jiang (University of Gävle)
- T09-11-1** Automatic crater detection by mining existing crater map  
Cheng-Zhi Qin, Yan-Wen Wang, Wei-Ming Cheng, A-Xing Zhu
  - T09-11-2** Lexical variation in Japanese dialects revisited: Geostatistic and dialectometric analysis  
Péter Jeszenszky, Yoshinobu Hikosaka, Keiji Yano
  - T09-11-3** Spatial Component Models with Artificial Neural Networks for Spatially Constrained Regionalization  
Michael Govorov, Giedre Beconyte, Gennady Gienko
- 8:30-10:20 **T10-1 T10 GI for Sustainability** ..... **Mars (Miraikan)**  
 Chair: Alexander Panin (Lomonosov Moscow State University)
- T10-1-1** Spatial Modeling of Disaster Resilience in the Lower Mississippi River Basin  
Heng Cai
  - T10-1-2** Geographic Information and Geo-visualization in support of Disaster Resilience  
Edward Kurwakumire, Paul Muchechetere, Shelter Kuzhazha, Guy Blanchard Ikokou
- 8:30-10:20 **T11-3 Western Europe** ..... **Saturn (Miraikan)**  
 Chair: Alastair William Pearson (University of Portsmouth)
- T11-3-1** Kaleidoscope of Swiss Cartography  
Stefan Raber, Lorenz Hurni
  - T11-3-2** Mapping in Belgium in the 19th Century in a wider context  
Philippe De Maeyer
  - T11-3-3** Thematic cartography of Portuguese winegrowing (1850-1952)  
Mário Gonçalves Fernandes, Helder Trigo Marques
  - T11-3-4** ‘Heaping Offa upon Pelion, and Olympus upon Offa’: An assessment of the role of model making in the development of relief portrayal from 1780 to 1900.  
Alastair William Pearson
- 9:20-10:20 **T38-1 Mapping the Environment 1** ..... **Conference Room 4+5 (Plaza Heisei)**  
 Chair: Márton Pál (ELTE Eotvos Lorand University)
- T38-1-1** Mapping of Physical Vulnerability in Tiger Habitat Areas: A Case Study of Tiger Corridor of Rajasthan, India  
Bhanwar Vishvendra Raj Singh, Anjan Sen
  - T38-1-2** The visible impacts of human activities constructing hydropower dam on Vietnamese Mekong Delta and conceptual solutions for responses  
Nhan Nguyn Huu, Shigeko Haruyama
  - T38-1-3** Digital cartography for geoheritage: turning an analogue geotourist map into digital  
Márton Pál, Gáspár Albert
- 9:20-10:20 **T40-1 AI, Robotics, Autonomous Cars and Mapping 1** ..... **Conference Room 1 (Plaza Heisei)**  
 Chair: Song Gao (University of Wisconsin)
- T40-1-1** Transferring Multiscale Map Styles Using Generative Adversarial Networks  
Yuhao Kang, Song Gao, Robert E Roth
  - T40-1-2** A object detection algorithm based on pyramid Convolutional Neural Networks(CNN) and feature map fusion model  
Nu Wen
  - T40-1-3** Towards Storytelling with Animated Pictorial Map Objects – An Experiment with Convolutional Neural Networks  
Raimund Schnürer, Cengiz Öztireli, René Sieber, Lorenz Hurni

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- 9:20-10:20 **T43-1 Maps and society** ..... **Conference Room 3 (Plaza Heisei)**  
 Chair: Koshiro Suzuki (University of Toyama)
- T43-1-1** Treatment of cartography in official classification of fields of sciences and its misuse by the State Educational Inspectorate and the University of Tetova  
Bashkim Idrizi
  - T43-1-2** Connecting users to trusted geospatial information for Europe  
Michael John Cory
- 10:50-12:10 **SS2 Waldo Tobler memorial session** ..... **International Conference Hall (Plaza Heisei)**  
 Chair: Aileen Buckley (Research Cartographer at Esri, Inc)
- SS2-1** Round table  
Aileen Buckley, Menno-Jan Kraak, Sara Fabrikant, Timothy Trainor, Harold Moellerling
- 10:50-12:10 **T08-2 Shape and multi-scale measures** ..... **Uranus (Miraikan)**  
 Chair: Paulo Raposo (University of Tennessee, Knoxville, USA)
- T08-2-1** Between the Lines: Measuring Areal Displacement in Line Simplification  
Barry J Kronenfeld, Jiaxin Deng
  - T08-2-2** Building-network: Concept, generation method and centrality analysis  
Xiao Wang, Dirk Burghardt
  - T08-2-3** Exploring essential variables in the settlement selection for small-scale maps using machine learning  
Izabela Karsznia, Karolina Sielicka
- 10:50-12:10 **T09-12 Investigating spatial patterns** ..... **Miraikan Hall (Miraikan)**  
 Chair: X.Angela Yao (University of Georgia)
- T09-12-1** Research on the Spatial Distribution Pattern of Producer Service Firms in Urban Harbin  
Zhao Yang Yang, Liu Ji Ping, Zhang Fu Hao, Liu Meng Meng
  - T09-12-2** Exploring spatio-temporal hotspots of land price change with housing transaction data in Seoul  
Seonga Cho, Gunhak Lee
  - T09-12-3** Where do taxi trips start and end? Implications For Future Car-sharing For Commuting  
Pengyu Zhu, Yong-Hong Kuo, Marlon Ives Tanuihusada, Wei Qiang, Jie Wang
  - T09-12-4** A spatial analytical approach towards understanding racial residential segregation in Gauteng province (South Africa)  
Samy Katumba, Inger Fabris-Rotelli, Alfred Stein, Serena Coetzee
- 10:50-12:10 **T11-4 Older Japan Cartography** ..... **Saturn (Miraikan)**  
 Chair: Hirotada Kawamura (Professor Emeritus at Yamaguchi Univ.)
- T11-4-1** The national map of Japan compiled by the Tokugawa Shogunate  
Hirotada Kawamura
  - T11-4-2** The Revising Process of 'Kaisei Nihon Yochirotei Zenzu (Sekisui-zu)'  
Toshikazu Kaida
  - T11-4-3** Global influence of the map of Japan produced by Japanese cartographer Sekisui Nagakubo  
Motohiro Tsujimoto
- 10:50-12:10 **T27-1 Social Applications of Geovisual Analytics** ..... **Conference Room 2 (Plaza Heisei)**  
 Chair: Anthony Robinson (The Pennsylvania State University)
- T27-1-1** Visual Analytics for Regional Economic Environment Factors Based on a Dashboard Design  
Chenyu Zuo, Linfang Ding, Liqiu Meng
  - T27-1-2** Reasoning about Socio-Economic Data: A Visual Analytics Approach to Bayesian Network  
Ekaterina Chuprikova, Liqiu Meng
  - T27-1-3** Geovisual analysis of VGI for understanding people's behaviour in relation to multifaceted context  
Natalia Andrienko, Gennady Andrienko, Siming Chen, Dirk Burghardt, Alexander Dunkel, Ross Purves
- 10:50-12:10 **T30-7 GIS, Remote Sensing and Cartographic Theory, Methodology and Applications (7)** ..... **Innovation Hall (Miraikan)**  
 Chair: Tzai-Hung Wen and Takashi Oguchi (National Taiwan Univ., Univ. Tokyo, Japan)
- T30-7-1** Mapping Anisotropic Landscape for Understanding Underlying Spatial Structure of Air Pollution  
Chen-Hsuan Tu, Tzai-Hung Wen

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- T30-7-2** **Remote Sensing and Geospatial Analytics for Sustainable Development Assessment in Urban Areas**

Xiaojun Yang, Di Shi, Feilin Lai, Shijun Jiang, Ranhao Sun

- T30-7-3** **Characterizing Spatial Variations of Urban Growth Patterns in Beijing, China through Spatial Analysis and Geovisualization**

Ting Liu, Xiaojun Yang

- 10:50-12:10 **T38-2 Mapping the Environment 2** ..... **Conference Room 4+5 (Plaza Heisei)**

Chair: Beata Medynska-Gulij (Adam Mickiewicz University in Poznan)

- T38-2-1** **Potential Groundwater Extraction and Piezometric Surface Fluctuations in Puruliya, West Bengal – A GIS based study**

Devarupa Gupta

- T38-2-2** **Wetland Loss in Northeastern Italy Documented by Historical Maps**

Silvia Elena Piovan, Marco Filippini, Michael Edward Hodgson

- T38-2-3** **Statistical maps for comparative visualization of landscape changes for industrial centers from different countries**

Beata Medyńska-Gulij, Paweł Cybulski, Łukasz Wielebski, Dariusz Lorek, Tymoteusz Horbinsk

- 10:50-12:10 **T40-2 AI, Robotics, Autonomous Cars and Mapping 2** ..... **Conference Room 1 (Plaza Heisei)**

Chair: Dalia Elena Varanka (U.S. Geological Survey)

- T40-2-1** **Demolished building detection from aerial imagery using deep learning**

Shu Su, Takahiko Nawata

- T40-2-2** **Possibilities of high precision GPS data in autonomous driving**

Márton Pál, Fanni Vörös, István Elek, Béla Kovács

- T40-2-3** **Automated Extraction of Drainage Channels and Roads through Deep Learning**

Lawrence V Stanislawski, Tyler Brockmeyer, Ethan Shavers

- T40-2-4** **Scoping a vocabulary for spatial relation properties**

Dalia Elena Varanka

- 10:50-12:10 **T43-2 Miscellaneous maps (1)** ..... **Conference Room 3 (Plaza Heisei)**

Chair: Yoshiaki Wakabayashi (Tokyo Metropolitan University)

- T43-2-1** **Long term archiving orienteering maps project in Slovenia**

Dušan Petrovič

- T43-2-2** **The role of disease maps in influenza epidemiological surveillance in Japan**

Tomohiko Arahori

- T43-2-3** **Questionnaire Survey about the Reasons of Young People Migrating to the Tsunami-hit Area**

Kayo Okabe, Mayumi Dan, Chikako Nakayama

- T43-2-4** **Seeing the Night Sky**

Colin G. Flynn, Matthew T. Rice

- 13:30-14:30 **Keynote Presentation 4** ..... **International Conference Hall (Plaza Heisei)**

Eric Gundersen

- 14:50-16:10 **T08-3 Generalization in Practice** ..... **Uranus (Miraikan)**

Chair: Pia Bereuter (FHNW University of Applied Sciences of Northwestern Switzerland)

- T08-3-1** **CartAGen: an Open Source Research Platform for Map Generalization**

Guillaume Touya, Imran Lokhat, Cécile Duchêne

- T08-3-2** **Real-time Cartographic Generalisation: Risk Management Maps Case Study**

Karel Stanek, Petr Silhak

- T08-3-3** **A Parallel Method for Accelerating Visualization for Vector Tiles**

Wei Hu, Lin Li, Chao Wu, Hang Zhang, Haihong Zhu

- 14:50-16:10 **T09-13 Terrain analysis, modeling, and visualization** ..... **Miraikan Hall (Miraikan)**

Chair: Lei Zou (Texas A&M University)

- T09-13-1** **Density maps of geophysical study as a new type of integrated characteristic of geophysical fields in atlases**

Dmitriy Sergeyevich Loginov, Sergey Anatolyevich Krylov

- T09-13-2** **Geographical Scene Reconstruction and Application of Ancient Site with Fused Multi-source Data**

Lin Yang, Jiangwei Shen, Fangzihao Zheng

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- 14:50-16:10 **T11-5 Japan and Korea in 19th Century** ..... **Saturn (Miraikan)**  
 Chair: Shosuke Hosoi (Cartographic Information Office)
- T11-5-1** An Analysis on the Shape Changes of the Korean Peninsula on the British Charts of the 19th Century and Identification of Factors that Influence the Changes  
Jong Geun Kim
  - T11-5-2** Japan's Most Famous Surveyor: Ino Tadataka and His Iconic 1821 Map of Japan  
John Francis Brock
  - T11-5-3** Restoration of the early 19th century's geomagnetic declinations in Japan, from Tadataka Inoh's survey azimuth ledger.  
Motohiro Tsujumoto, Akitoshi Omotani
  - T11-5-4** Modernization of Topographic Mapping by Japan Meiji Government - Introduction of French Army Mapping Technology and afterwards -  
Shosuke Hosoi
- 14:50-16:10 **T14-1 National and Local Mapping Initiatives** ..... **Mercury (Miraikan)**  
 Chair: Melissa Ann West (Member of NZ Cartographic Society)
- T14-1-1** BDIG: Continuous updating for National Geospatial Information Databases in National Geographic Institute of Spain.  
Gonzalo Moreno, Francisco Mariño, Alfonso Marín, Pablo Barreira, Francisco Javier González-Matesanz, Pilar Sánchez Ortiz
  - T14-1-2** How do the Swiss produce their New National Map Series?  
Mark Dominic Wigley
  - T14-1-3** Mapping New Zealand 2025 – A National Perspective  
Karl Baker, Roger Carman
- 14:50-16:10 **T15-1 Map Projections Knowledge** ..... **Mars (Miraikan)**  
 Chair: Bojan Šavrič (Esri, Inc.)
- T15-1-1** A Semantic Representation of Map Projections Knowledge  
E. Lynn Usery
  - T15-1-2** Map Projection Article on Wikipedia  
Miljenko Lapaine
  - T15-1-3** Harmonization of different type of coordinate systems used for North Macedonian official spatial data  
Bashkim Idrizi
- 14:50-16:10 **T27-2 Design & Computation in Geovisualization** ... **Conference Room 2 (Plaza Heisei)**  
 Chair: Arzu Coltekin (University of Applied Sciences and Arts, Northwestern Switzerland)
- T27-2-1** On the relevance of cartography — An interaction design perspective  
Sebastian Meier, Jordi Tost, Frank Heidmann
  - T27-2-2** Given the problem of projection, are heat maps an oxymoron?  
Daniel Strebe
  - T27-2-3** The Levenshtein distance as a measure of mirror symmetry and homogeneity for binary digital patterns  
Godfried Theodore Toussaint
- 14:50-16:10 **T30-8 GIS, Remote Sensing and Cartographic Theory, Methodology and Applications (8)** ..... **Innovation Hall (Miraikan)**  
 Chair: Tzai-Hung Wen and Takashi Oguchi (National Taiwan Univ., Univ. Tokyo, Japan)
- T30-8-1** Delineating urban functional regions by considering interaction cohesiveness and function diversity  
Fei-Ying Felix Kuo, Tzai-Hung Wen
  - T30-8-2** An investigation of geographic object based image analysis (GEOBIA) for human settlement detection in South Africa  
Luncedo Ngcofe, Nale Mudau
  - T30-8-3** Understanding the Process of Geospatial Reasoning: Evidences from an Eye-Tracking Experiment  
Tzai-Hung Wen, Hao-Yu Liao
  - T30-8-4** On the Way to an Information System of Russian Transport Networks  
Irina Lurie, Ali Alyautdinov, Elena Prokhorova, Vladinir Semin

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- 14:50-16:10 **T32a-1 Mapping cities (1)** ..... **Venus (Miraikan)**  
 Chair: Naoto Yabe (Tokyo Metropolitan University)
- T32a-1-1** Visualising a comparison of simulated urban heat islands: a case study of two Slovakian cities  
Jan Feranec, Juraj Holec, Pavel Stastný, Daniel Szatmári, Monika Kopecká
  - T32a-1-2** Interactive 3D Time-Integrated Solar Shadow Maps  
Georg Molzer, Florian Ledermann
  - T32a-1-3** Is the neighbourhood a level suited to the thermal evaluation of energy loss from buildings?  
Nathalie Molines, Eduard Antaluka, Fabien Lamarque
- 14:50-16:10 **T37-1 SDGs and Cartography 1 (concept)** ..... **Conference Room 1 (Plaza Heisei)**  
 Chair: Ayako Kagawa (United Nations)
- T37-1-1** A Sustainable world with cartography  
Ayako Kagawa, Kyoung-Soo Eom
  - T37-1-2** Seeing the UN Sustainable Development Goals through Maps  
Menno-Jan Kraak, Britta Ricker, Rob Roth
  - T37-1-3** SDG Viz: A Web-based System for Visualizing Sustainable Development Indicators  
Xinyu Gong
  - T37-1-4** Employing GIS towards shaping a smart and sustainable future: a brief policy survey of global and Taiwan's efforts  
Chih-Wei Chen, Ching-Yi Lin, Chine-Hung Tung, Hsiung-Ming Liao, Jr-Jie Jang, Kun-Chi Lai, Meng-Ying Li, Yin-Ling Huang
- 14:50-16:10 **T38-3 Mapping the Environment 3** ..... **Conference Room 4+5 (Plaza Heisei)**  
 Chair: Abdul Rauf Abdul Rasam (Universiti Teknologi)
- T38-3-1** The transition process of aerosol distribution state with spatio-temporal analysis based on MODIS product  
Su Wei Qing, Zhang Hong, Chen Li Lon
  - T38-3-2** Examination of car navigation systems and UX designs – suggestion for a new interface  
Fanni Vörös, Zoltán Tompos, Béla Kovács
  - T38-3-3** Disease Mapping and Spatial Landscape Characterization of Tuberculosis Ecology in Malaysia  
Abdul Rauf Abdul Rasam, Noresah Mohd Shariff
- 14:50-16:10 **T43-3 Miscellaneous maps (2)** ..... **Conference Room 3 (Plaza Heisei)**  
 Chair: Yoshiki Wakabayashi (Tokyo Metropolitan University)
- T43-3-1** Geospatial Distribution and Accessibility of Primary and Secondary Schools: A case of Abbottabad City, Pakistan  
Neema Simon Sumari, Hashir Tanveer, Zhenfeng Shao, Ernest Simon Kira
  - T43-3-2** Bayesian Geographical Multi-Dimensional Scaling  
Hayato Nishi, Yasushi Asami
  - T43-3-3** A missing link in cartographic visualization? A case study of “heat maps” effectiveness  
Tomasz Panecki, Wojciech Pokojski
  - T43-3-4** Exploring Spatiotemporal Characteristics in the Twitter Data Using Topic Modelling Techniques  
Young-Hoon Kim, Hyun Jee Woo
- 16:40-18:00 **T08-4 Scale issues in Visualization** ..... **Uranus (Miraikan)**  
 Chair: Guillaume Touya (LASTIG, IGN France)
- T08-4-1** Focus+Context Map Labeling with Optimized Clutter Reduction  
Benjamin Niedermann, Jan-Henrik Haunert
  - T08-4-2** Automatic tactile thematic map generation: research agenda and possible solutions  
Jakub Wabinski, Albina Moscicka
  - T08-4-3** A Self-Adaptive Method of Multi-scale POI Visualization in Indoor Map  
Yi Xiao, Tinghua Ai, Mengying Jiang, Chen Weng, Miqi Wang
  - T08-4-4** Conceptual framework for enhancing visual change point analysis in generalized multi-temporal displays  
Jochen Schiewe

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16:40-18:00 **T11-6 Surveying and Mapping** ..... **Saturn (Miraikan)**

Chair: David Fairbairn (Newcastle University)

**T11-6-1** Advancing Reconnaissance and Valorisation: Map Series of German South West Africa

(Namibia), 1892-1918

Imre Demhardt

**T11-6-2** The bicycle at the end of the 19th century: An instrument for land surveying and mapping

Tristan Thielmann

**T11-6-3** Database of Historical Atlases: An Interactive Web Application

Petra Jílková, Jiří Cajthaml

**T11-6-4** Reconstructing the lost contours of Charles Hutton

Karen Rann, David Fairbairn, Ella Southern

16:40-18:00 **T14-2 Map Production Technologies, Management and Certification** ... **Mercury (Miraikan)**

Chair: Peter Kunz (Federal Agency for Cartography and Geodesy (BKG))

**T14-2-1** Multiscale cartographic visualization of harmonized datasets

Peter Kunz, Joachim Bobrich

**T14-2-2** Technology research on Public welfare map adaptively and quickly producing

Zhu Xiu Li, Zhao Yong, Liu Wan Zeng, Wu Chen Chen, Wang Zhongxiang

**T14-2-3** Certificates for High-Quality Cartographic Products

Temenoujka Bandrova, Miljenko Lapaine, Silvia Marinova

**T14-2-4** An Algorithm of Automatic Administrative Region Index Map Generation for National-level Map Production

Ruolei Wang, Jianjun Liu, Zhao Li, Jun Zhang

16:40-18:00 **T15-2 Map Projections Characteristics** ..... **Mars (Miraikan)**

Chair: E. Lynn Usery (U.S. Geological Survey)

**T15-2-1** The Equal Earth Projection: Distortion Characteristics, Adoption, and (Social) Media Impact

Bojan Savrič, Bernhard Jenny, Tom Patterson

**T15-2-2** Polar and Equatorial Aspects of Map Projections?

Miljenko Lapaine, Nedjeljko Frančula

16:40-18:00 **T27-3 Visualizing Flows & 3D Geovisualization** ... **Conference Room 2 (Plaza Heisei)**

Chair: Paulo Raposo (The University of Tennessee)

**T27-3-1** Creating Maps of Artificial Spaces for Exploring Trajectories

Gennady Andrienko, Natalia Andrienko

**T27-3-2** Workflow for 3D geovisualization of the data obtained with the use of Unmanned Aerial Vehicle in Augmented Reality

Łukasz Halik, Maciej Smaczyński, Beata Medyńska-Gulij

**T27-3-3** Geovisualization of complex origin-destination flow maps using Discrete Global Grid Systems

Paulo Raposo

**T27-3-4** Using Focus + Context Techniques to Visualize Building Information Model in virtual Geo-Environment

Shen Ying, Chengpeng Li, Weiyang Li, Naibin Chen, Zhigang Zhao

16:40-18:00 **T30-9 GIS, Remote Sensing and Cartographic Theory, Methodology and Applications (9)** ..... **Innovation Hall (Miraikan)**

Chair: Tzai-Hung Wen and Takashi Oguchi (National Taiwan Univ., Univ. Tokyo, Japan)

**T30-9-1** Detecting land cover change using Sentinel-2

Koji Osumi

**T30-9-2** The visualization of the use of land on the basis of the dynamics of the pedestrian movement from the interval UAV imaging

Maciej Smaczyński, Beata Medyńska-Gulij, Łukasz Halik

**T30-9-3** Method of Elaboration of Detailed Existing Land Use (ELU) Map of Poland

Dariusz Ryszard Dukaczewski

**T30-9-4** The application of GIS in railway heritage management: the case of Yunnan-Vietnam Railway

Kun Sang, Silvia Elena Piovan

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16:40-18:00 **T32a-2 Mapping cities (2)** ..... **Venus (Miraikan)**

Chair: Naoto Yabe (Tokyo Metropolitan University)

**T32a-2-1** **Automated Generation of Schematic Network Maps with Preservation of Main Structures**  
Tian Lan, Zhilin Li

**T32a-2-2** **Multivariate thematic mapping using fractal glyphs**  
Antoni Moore, Bin Jiang

**T32a-2-3** **Measuring the Street Layout Orientation Entropy of Cities in the Philippines**  
Homer Marquez Pagkalinawan

**T32a-2-4** **The Use of Cartometric and Participatory Methods for Evaluating Regional Boundaries in Kaligesing Sub-district, Purworejo, Indonesia**  
Sudaryatno, Bagus Wiratmoko, Raden Ramadhan Yuda

16:40-18:00 **T37-2 SDGs and Cartography 2 (discussion)** ..... **Conference Room 1 (Plaza Heisei)**

Chair: Menno-Jan Kraak (University of Twente)

**T37-2-1** **Sustainable Development Goals and Visualizing Small Island Developing States**  
Jessica Gosling-Goldsmith, Britta Ricker, Menno Jan Kraak

**T37-2-2** **Alternate thematic maps to visualize United Nations Sustainable Development Goal indicator data**  
Natasha Pirani, Britta Ricker, Menno Jan Kraak

16:40-18:00 **T43-4 Mapping geospatial data** ..... **Conference Room 3 (Plaza Heisei)**

Chair: Kaori Ito (Tokyo University of Science)

**T43-4-1** **Giving life to the map can save more lives. Wildfire scenario with interoperable simulations.**  
Walter David, Francesco Giannino, Duncan Heathfield, Antony Hubervic, Attila Aknai, Athanasios Sfetsos, Silvia Elena Piovan

**T43-4-2** **GIS-based hillshade representation combined with relative relief as pseudo shade to enhance micro-topography**  
Keiko Suzuki, Go Ishikawa

**T43-4-3** **Towards a new face for Planetary Maps: Design and Web-based Implementation of Planetary Basemaps**  
Andrea Nass, Nicolas Manaud, Stephan Van Gasselt, Trent Hare

**T43-4-4** **Estimation of three dimensional structure of forest and development of roots of trees using LiDAR data**  
Mamoru Koarai, Akane Rarikiyo, Wataru Watanabe

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## Poster

8:30-18:00

- Poster Session P4 ..... Jupiter (Miraikan)**
- P4-01** Curve Generalization Algorithm Based on Area of Bends using Head/tail Breaks  
Hangyu Wang, Haowen Yan
  - P4-02** Quality assessment of topographic data automatic map generalization from scale 1:10 000 to 1:50 000  
Luo Fu Jun, Zhao You Song, Ma Xu, Wu Xua
  - P4-03** Deriving Multiple Representation Database: A Model Generalisation Approach  
Jagadish Boodala, Onkar Dikshit, Nagarajan Balasubramanian
  - P4-04** Incremental Updating Information Extraction and Topology Conflict Detection Method for Updating Road Network  
Jianchen Zhang, Heying Li
  - P4-05** Proposition of a Schematization Plugin for QGIS  
Luciene Stamato Delazari, Isadora Barioni
  - P4-06** Dot Symbol Auto filling Method for Land use Areas in Cartgraphic Representation  
Yong Yin, Chengcheng Zhana
  - P4-07** Spatial Analysis to Identify Factors Affecting Residential Land Prices in Disaster Areas  
Keiko Inagaki, Satoru Sadohara
  - P4-08** From walkability to bikeability: A GIS based analysis of integrating bike sharing service in Tokyo TOD system  
Tianqi Xia, Xiaoya Song, Xuan Song, Min Lu, Shuzhe Huang, Ryosuke Shibasaki, Kyoung-Sook Kim
  - P4-09** Design of cooperative update mechanism of national geographic conditions monitoring and basic surveying and mapping  
Luo Fu Jun, Zhao You Song
  - P4-10** LevelFilesSet: An efficient Data Structure for Scalable Web Tiled Map Management Systems  
Menelaos Kotsollaris, William Liu, Emmanuel Stefanakis, Yun Zhang
  - P4-11** Rapid Mapping for German Federal Authorities  
Karsten Schmidt, Marian Graumann, Joachim Bobric
  - P4-12** Research on Event-based Geospatial Data Updating  
Zhao Zhou
  - P4-13** The evolution of spatial structure of China railway network in the past century  
Yalan Bai
  - P4-14** Map Production Supporting Activities of Digitalization and AI  
Markus Jobst, Georg Gartner
  - P4-15** The definition of scale series for atlas maps depending on the density of mapped objects  
Gleb Igorevich Zagrebin, Sergey Anatolyevich Krylov
  - P4-16** Research and implementation of big data visualization based on WebGIS  
Lu Wen Juan, Aiguo Liu, Chengcheng Zhang
  - P4-17** Visual analysis of ICC themes and topics from 2009 to 2019  
Li Jing, Liu Hai Yan, Kang Lei
  - P4-18** Table cartogram generation as an optimization problem  
Mao Li, Ryo Inoue
  - P4-19** Mapping urban greenery to create the optimal cooling effect model against solar radiation under the conditions of a smart city  
Vladimír Sedlák, Katarína Onačillová, Michal Gallay, Jaroslav Hofierka, Ján Kaňuk, Ján Šašák, Jozef Šupinský
  - P4-20** Social climate of cities as a factor of economic growth (on the example of the city of Kerch)  
Alexander Borisovich Zaitsev, Lazareva I.V., Melnikova I.V.
  - P4-21** Mapping the hot and cold spots of spatial change in Tokyo following the bubble economy period  
Ryo Koizumi, Yoshiki Wakabayashi
  - P4-22** Mapping Gentrification in Little Tokyo, Los Angeles: Using Geographic Information System (GIS) Analytical Tools  
Saki Nakashima

# Friday, July 19

Miraikan  
Plaza Heisei  
\*name...presenter

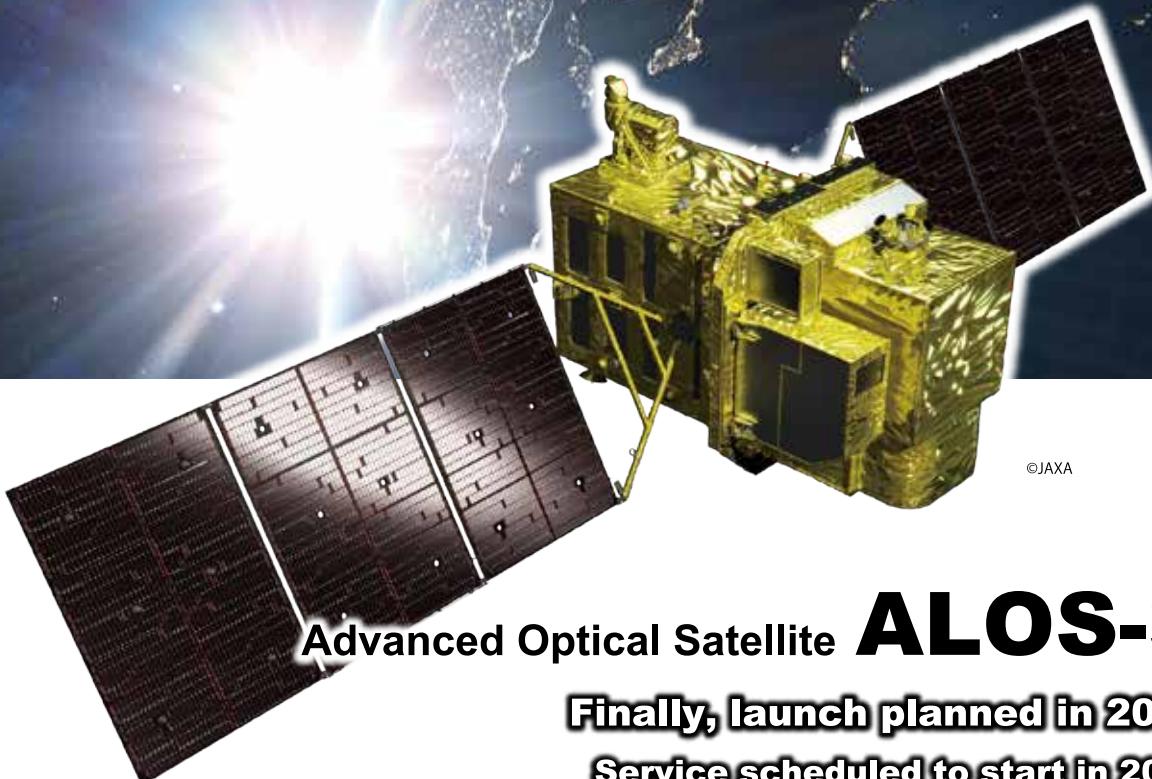
- P4-23 **Automated Extraction of Driving Lines from Mobile Laser Scanning Point Clouds**  
Lingfei Ma, Tianyu Wu, Ying Li, Jonathan Li, Yiping Chen, Michael Chapman
- P4-24 **A Study on the Distribution of Foreign-Female-Isolated Areas in Japan**  
Kohei Okamoto, Masatoshi Morita
- P4-25 **Los Angeles Homelessness and the Access to Water, Sanitation, and Hygiene (WaSH)**  
Lourdes Johanna Avelar, Yao-Yi Chiang, Robert O. Vos, Jose Rico, Yanyi Qian, Xiaozhe Yin, Kate Vavra-Musser
- P4-26 **Effect of Land tenure change on Land use in Machakos County, Kenya**  
Mary Wamuyu Baaru, Charles Karanja Gachene
- P4-27 **Stereo RGB-D indoor mapping with precise stream fusing strategy**  
Shengjun Tang, Weixi Wang, Xiaoming Li, Zhilu Yuan
- P4-28 **Mapping of reforestation progress in Chilean National Park Torres del Paine**  
Italo Marquez, Guido Staub
- P4-29 **Mapping of the maritime jurisdiction for Arctic Navigation**  
Haiyan Liu, Xiaoping Pang
- P4-30 **Surface and Volume Variation Determination of Laguna de Laja (Chile) since 2007**  
Esteban Fernandez, Guido Staub
- P4-31 **Utilizing the Road Mark Training Set from Ground-Based Mapping System to Airborne Imagery in Deep Learning Framework**  
Tee-Ann Teo
- P4-32 **There is no Kashubia without Kashubians - maps as sources in historical research of folk culture**  
Agnieszka Małek
- P4-33 **Map Usage on Smartphones and Acquisition of Spatial Knowledge**  
Noriko Shingaki
- P4-34 **The Spatial-temporal Variation of Precipitation and Temperature in Xinjiang in Recent 50 Years**  
Wang Yu Zhu, Yan Hao Wen, Wang Xiao Ping, Wang Zhuo

# Commission Business Meeting

<b>Code</b>	<b>Commission</b>	<b>Date</b>	<b>Time</b>	<b>Venue</b>	<b>Room</b>
B01	Art and Cartography	Tue 16th July	12:10-13:30	Miraikan	Saturn
B02	Atlases	Tue 16th July	12:10-13:30	Miraikan	Innovation Hall
B03	Cartgraphic Heritage into the Digital	Thu 18th July	12:10-13:30	Miraikan	Uranus
B04	Cartography and Children	Tue 16th July	12:10-13:30	Miraikan	Mars
B05	Cartography in Early Warning and Crisis Management	Tue 16th July	12:10-13:30	Miraikan	Venus
B06	Cognitive Issues in Geographic Information Visualization	Tue 16th July	12:10-13:30	Plaza Heisei	Conference Room 2
B07	Education and Training	Wed 17th July	12:10-13:30	Miraikan	Venus
B08	Generalisation and Multiple Representation	Fri 19th July	12:10-13:30	Miraikan	Uranus
B09	Geospatial Analysis and Modeling	Thu 18th July	12:10-13:30	Miraikan	Miraikan Hall
B10	GI for Sustainability	Fri 19th July	12:10-13:30	Miraikan	Mars
B11	History of Cartography	Fri 19th July	12:10-13:30	Miraikan	Saturn
B12	Location Based Services	Tue 16th July	12:10-13:30	Miraikan	Uranus
B14	Map Production and Geoinformation Management	Wed 17th July	12:10-13:30	Miraikan	Uranus
B15	Map Projections	Fri 19th July	12:10-13:30	Miraikan	Innovation Hall
B16	Maps and Graphics for Blind and Partially Sighted People	Thu 18th July	12:10-13:30	Miraikan	Mercury
B17	Maps and the Internet	Thu 18th July	12:10-13:30	Plaza Heisei	Conference Room 1
B18	Mountain Cartography	Wed 17th July	12:10-13:30	Miraikan	Mars
B19	Open Source Geospatial Technologies	Wed 17th July	12:10-13:30	Miraikan	Mercury
B20	Planetary Cartography	Fri 19th July	12:10-13:30	Miraikan	Mercury
B21	SDI and Standards	Thu 18th July	12:10-13:30	Miraikan	Saturn
B22	Sensor-driven Mapping	Fri 19th July	12:10-13:30	Miraikan	Venus
B23	Topographic Mapping	Wed 17th July	12:10-13:30	Miraikan	Saturn
B24	Toponymy	Tue 16th July	12:10-13:30	Miraikan	Mercury
B25	Ubiquitous Mapping, Spatial DB and IoT-Based Systems	Tue 16th July	12:10-13:30	Plaza Heisei	Conference Room 1
B26	Use, User and Usability Issues	Thu 18th July	12:10-13:30	Plaza Heisei	Conference Room 2
B27	Visual Analytics	Fri 19th July	12:10-13:30	Plaza Heisei	Conference Room 2
B28	Marine Cartography	Thu 18th July	12:10-13:30	Miraikan	Venus
B99	Geospatial Semantics	Thu 18th July	12:10-13:30	Miraikan	Mars

# Satellite Data Application Business Expansion!

**Data acquired by the Earth Observation Satellites  
are expanding the range of applications**



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PASCO is responsible for operating ALOS-3 and promoting global utilization

## Satellite data application examples

Mapping and  
revision

Disaster  
monitoring

Environmental  
countermeasures

>> Introducing at the exhibition. Please stop by PASCO booth. <<

伊能先生、200年後の日本はいかがですか。

How do you like Japan after the 200 years from your work, Mr.Ino?

伊能忠敬の大日本沿海輿地全図が完成して約200年。

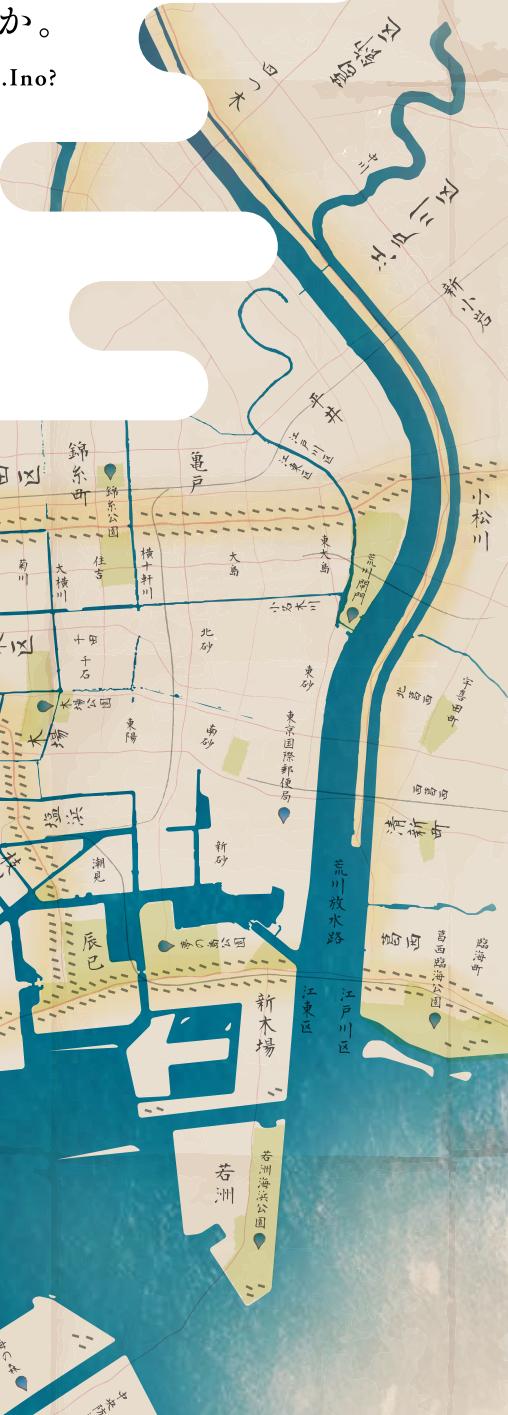
時代が移り変わっても、地図への想いは変わりません。

地図で未来を切り拓く。それが私たちの想いです。

About 200 years since Ino's Dainihon Enkaiyochi Zenzu.

The time passed, the passion never changed.

Open up the future with cartography, is our blueprint.



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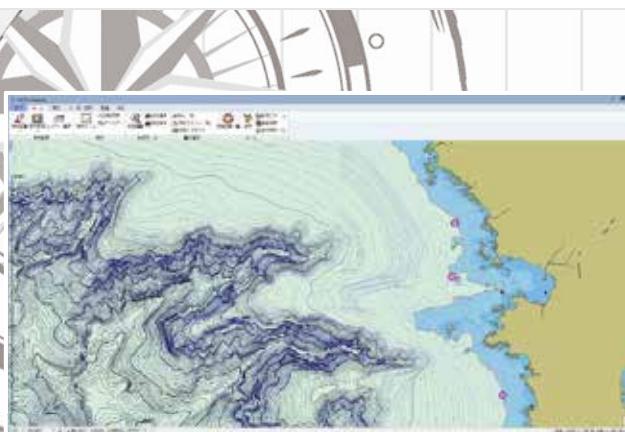
〒003-0005 札幌市白石区東札幌5条1丁目1-1  
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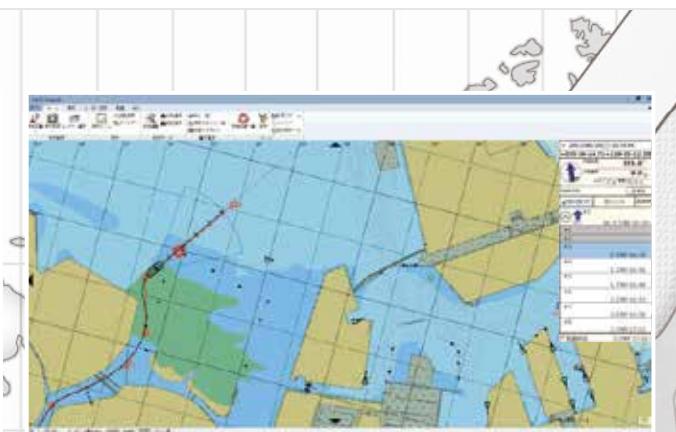
© OpenStreetMap contributors



Electronic Chart System



電子海図+海底地形図



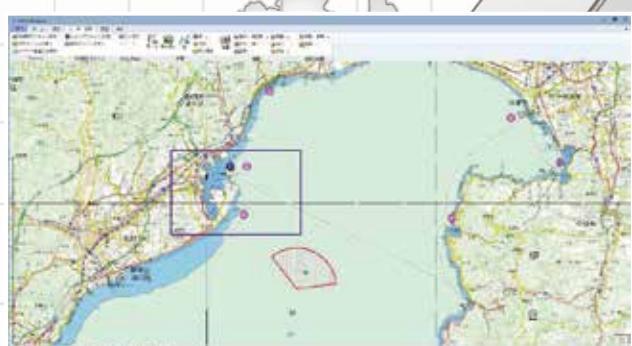
自船航跡の表示(ヘッドアップ)

## Windowsで使える電子海図利用支援システム

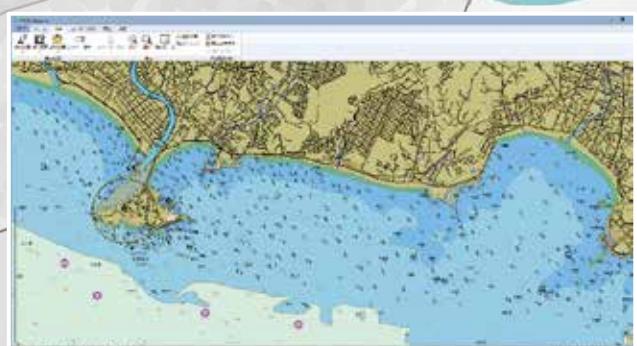
直感的な操作により**電子海図(ENC:Electronic Navigational Chart)**の表示や位置検索ができるることはもちろん、**電子海底地形図**や**国土基本情報**、**電子地形図**など様々な種類の地図を重畳表示することができます。

また、地図上には線・塗りつぶし・円・円弧などの図形や文字を簡単かつ自在に作成・配置でき、ユーザー独自の情報を作成することができます。ナビゲーション機能も備えており、大型船での補助システムとして利用することができるほか、オプションでAISデータや気象海象データを取り扱うこともできる、海上陸上どちらでも使えるシステムです。

電子海図の表示は電子海図形式および紙海図形式に対応しています。



電子海図+電子地形図+ユーザー作成図形



電子海図+国土基本情報



お問い合わせ先



日本総合システム株式会社  
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TEL:03-5805-3620 FAX:03-5805-3684  
URL:<https://www.nssys.co.jp>

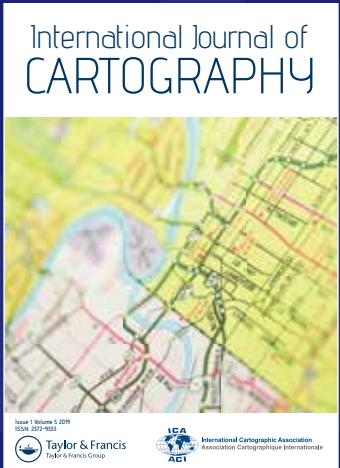


## **Cartography and Geographic Information Science**

*Cartography and Geographic Information Science (CaGIS)* is the official publication of the Cartography and Geographic Information Society. The Society supports research, education, and practices that improve the understanding, creation, analysis, and use of maps and geographic information.

The CaGIS journal implements the objectives of the Society by publishing authoritative peer-reviewed articles that report on innovative research in cartography and geographic information science.

[www.tandfonline.com/TCAG](http://www.tandfonline.com/TCAG)



## **International Journal of Cartography**

*International Journal of Cartography (IJC)* is the official flagship journal of the International Cartographic Association (ICA) which is a much needed research outlet concentrating on the map as a form of communication about the world, and aims to promote research in the fields of cartography and GI Science. The journal encompasses a wide range of topics including: spatial modelling, visualization, analysis and planning; theoretical GI Science including geospatial ontologies and semantics; maritime, environmental and urban GIS, remote sensing and photogrammetry; cognitive-based GIS and cartography; modelling of navigation knowledge and landscape perception in urban spaces and built environments; historical maps; art and cartography; topography.

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## **The Cartographic Journal**

*The Cartographic Journal* (first published in 1964) is an established peer reviewed journal of record and comment containing authoritative articles and international papers on all aspects of cartography, the science and technology of presenting, communicating and analysing spatial relationships by means of maps and other geographical representations of the Earth's surface. This includes coverage of related technologies where appropriate, for example, remote sensing, geographical information systems (GIS), the internet and global positioning systems. The Journal also publishes articles on social, political and historical aspects of cartography.

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