

Report of Commission on Location Based Services 2019-2023

<http://lbs.icaci.org/>

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1. Introduction

The ICA Commission on Location-Based Services (LBS) was established and extended by the ICA General Assembly in 2015 and 2019 respectively. Since then, we have been dedicated to building a community of researchers and other stakeholders of different backgrounds (scientific, engineering, and humanistic) to advance the research on LBS in all its interdisciplinary fields, with the aims to enable “anywhere, anytime, for anyone and anything” (4A) services.

LBS is an interdisciplinary research field. Within the LBS commission, we have been interested in any research topics related to LBS, including (without being limited to) outdoor and indoor positioning, context and user modelling, location tracking and processing, user interfaces, usability, privacy and social issues, smart cities, mobility and transportation applications, health applications, and so on.

This short report first summarizes the main activities of the LBS Commission in the last four years (2019-2023), as well as introduces some on-going activities during ICC 2023 and beyond. We then highlight our main achievements addressing the Terms of Reference (ToR).

2. Activities 2019-2023 – A Summary

During the last four years, the LBS Commission has been very active in promoting research and collaboration related to all aspects of LBS, as illustrated by a list of activities at <https://lbs.icaci.org/activities/>. The following summarizes some of the main ones.

2.1 LBS Conferences 2019-2023

Since its initiation in 2002, the LBS conference series has become one of the most important scientific events decided to LBS. In the past years, the LBS conferences travelled around the world – with venues in Hong Kong, Salzburg, Nottingham, Guangzhou, Munich, Shanghai, Vienna, Augsburg, and Zurich.

Since 2015, the LBS conference series has become the annual conference of the LBS Commission. For more details of the conference series, please refer to <http://lbsconference.org>.

- 15th International Conference on Location Based Services (LBS 2019), Vienna, Austria, 11-13 November 2019, <https://lbs2019.lbsconference.org/>



- 16th International Conference on Location Based Services (LBS 2021), Online, 24-25 November 2021, <https://lbs2021.lbsconference.org/>



"More Than One Digital Twin: An Ecology of Model Applications in East London"
Professor Michael Batty CBE FRS FBA



"LBS and Indigenous Data Sovereignty"
Professor Matt Duckham



"Location, place and language"
Dr Ross Purves



"Studying migratory bird navigation with spatial data science"
Dr Urška Demšar



"Open LBS Research: Why (not)?"
Dr Anita Graser

- 17th International Conference on Location Based Services (LBS 2022), Munich/Augsburg, Germany, 12-14 September 2022, <https://conferences.lfk.lrg.tum.de/lbs2022/>



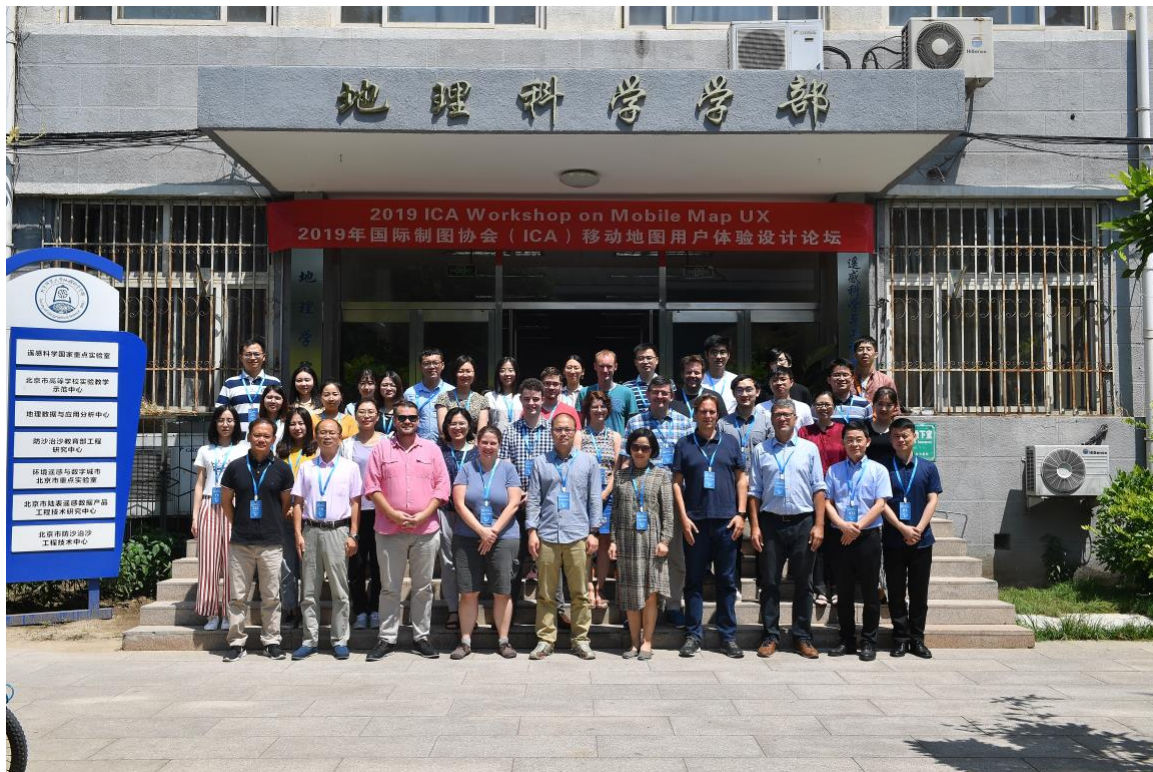
2.2 ICC Sessions and pre-ICC Workshops

- **LBS Sessions at ICC 2019:** 4 oral sessions dedicated to LBS, covering wayfinding, indoor and outdoor navigation, mobile cartography, mobility analysis and privacy.
- **ICC2019 Pre-Conference Symposium on Location-Based Big Data (LocBigData 2019)**, 15 July 2019, <https://lbs.icaci.org/locbigdata/>, jointly with the Commission on Geospatial Analysis and Modelling: the symposium program featured 22 oral presentations in 4 oral sessions, covering “computational place modelling”, “transportation modelling”, and “human mobility analytics”. These oral presentations provide a general picture of recent research activities related to location-based big data.

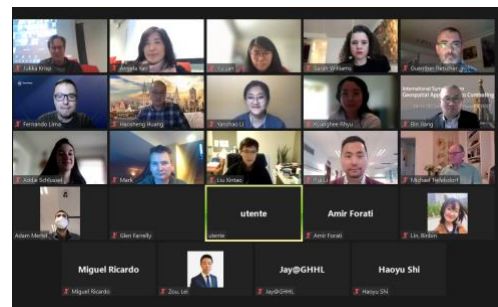
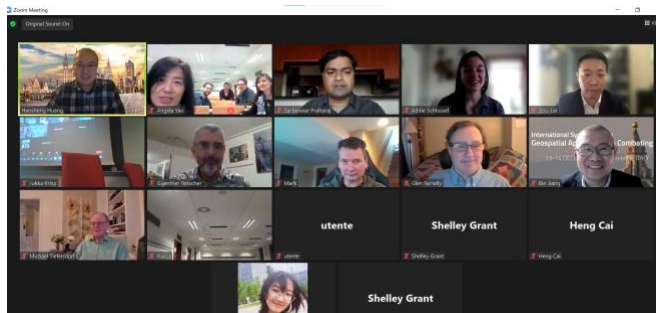


group photo at LocBigData 2019

- **ICC 2019 Pre-Conference Workshop on Mobile Map UX, Beijing, China, 11-12 July 2019**, jointly with the Commissions on LBS, Cognition, and UX. The first day focused on student engagement and establishing common ground on topics related to Mobile Map UX. Robert Roth (Use), Amy Griffin (Cognition), and Haosheng Huang (LBS) gave three presentations related to mobile map design, cognition, and location-based services. The 2nd day started by a series of 10-minute presentations, discussing “big problems” in mobile cartography. After the presentations, the workshop participants were divided into three groups, aiming to identify key research challenges and opportunities, and develop a working research agenda for mobile cartography.



- **LBS Sessions at ICC 2021:** 4 oral sessions dedicated to LBS, covering wayfinding, indoor and outdoor navigation, mobile cartography, mobility analysis and privacy.
- **ICC 2021 Pre-Conference Symposium on Geospatial Approaches to Combating Covid-19,** 11-13-14 December 2021, <https://gam.icaci.org/symposium2021/>, jointly with the Commission on Geospatial Analysis and Modelling: This symposium featured 34 oral presentations on Covid-19 research from the geospatial perspective.



2.3 Publications

During the last four years, several publications were developed by the LBS Commission. They provide a general picture of recent research activities within the domain of LBS. Such activities emerged in the last years, especially concerning issues of outdoor/indoor positioning, smart environment, spatial modeling, personalization, context-awareness, cartographic communication, novel user interfaces, crowdsourcing, social media, big data analysis, usability and privacy.

- Krisp, J., Meng, L., Kumke, H., Huang, H. (eds) (to appear): Special issue on Progress in Location-Based Services 2022. Journal of Location Based Services.
- Yao, X., Crooks, A., Jiang, B., Krisp, J., Liu, X., Huang, H. (2023): Special issue on Urban Analytical Approaches to Combatting Covid-19. Environment and Planning B: Urban Analytics and City Science. <https://journals.sagepub.com/doi/10.1177/23998083231174748>
- Krisp, J., Meng, L., Kumke, H., Huang, H. (eds) (2022): Proceedings 17th International Conference on Location Based Services (LBS2022), Munich / Augsburg, Germany, September 12-14, 2022, <https://conferences.lfk.lrg.tum.de/lbs2022/proceedings.html>
- Huang, H., Yao, X., Krisp, K., Jiang, B. (2021): Special issue on Geospatial Big Data Analytics for Smart Cities. Computers, Environment and Urban Systems. <https://www.sciencedirect.com/journal/computers-environment-and-urban-systems/special-issue/10R4F8J5G06>
- Basiri, A., Gartner, G., Huang, H. (2021): Proceedings 16th International Conference on Location Based Services (LBS2021), Online, November 23-25, 2021, <https://lbs2021.lbsconference.org/proceedings/index.html>
- Gartner, G., Huang, H. (eds.) (2019). 15th International Conference on Location Based Services (LBS 2019). Adv. Cartogr. GIScience Int. Cartogr. Assoc., Volume 2, <https://www.adv-cartogr-giscience-int-cartogr-assoc.net/2/index.html>
- Gartner, G., & Huang, H. (Eds.). (2019). LBS 2019: Adjunct Proceedings of the 15th International Conference on Location-Based Services. <https://doi.org/10.34726/lbs2019>



Selected Publications of the LBS Commission

2.4 Website and Mailing List

The LBS Commission maintains a blog-like website for the commission (<http://lbs.icaci.org/>). The website, which is updated regularly, aims to allow the commission members to exchange information, as well as to disseminate information on activities in this field to a wider public. Currently, the website also contains information regarding the LBS Research Agenda, as well as the LBS conference series.

Meanwhile, a moderated E-Mail list (ica_com_lbs@googlegroups.com) was also set up to facilitate the communication between the commission members. Currently, 168 members from all over the world have registered as the commission members, and the number is still increasing.

3. Ongoing Activities During ICC 2023 and Beyond

Several activities have been planned for the coming months.

- **Pre-ICC 2019 Symposium Symposium on Location-Based Big Data and GeoAI 2023 (LocBigDataAI 2023)**, Cape Town, South Africa, August 12, 2023: Organized jointly by the LBS Commission, the Commission on Geospatial Analysis and Modelling, and the ICA Working Group on Digital Transformation of National Mapping Agencies; More than 30 oral submissions have been accepted for the symposium; Authors of selected submissions will be invited to submit full papers for considerations for publications in the Special Issue on “GeoAI and Location Big Data for Smart Cities” of Computers, Environment and Urban Systems (CEUS); More details are available at <https://lbs.icaci.org/locbigdata2023/>.
- **LBS sessions at ICC 2023**: In addition to the regular oral sessions dedicated to LBS, we will also hold a business meeting at ICC 2023.
- **LBS 2023**, Ghent, Belgium, November 20-22, 2023: It will be hosted by Ghent University. The Call for Papers is currently open. We call for full papers, work in progress, and showcases. Deadlines for submission are June 15 for full papers, July 15 for work in progress, and September 12 for showcases. We are looking forward to your contributions! Please refer to <https://lbs2023.lbsconference.org/> for more information.
- **Special issue “Mobile Map Research Agenda” in Journal of Location Based Services**: joint efforts by the ICA Commissions on LBS, Cognition, and UX

4. Main Achievements Addressing the Terms of Reference

In the following, we briefly highlight the main achievements of the LBS Commission, with respect to the Terms of Reference.

Terms of Reference (2019-2023)	Main Achievements
Promote research on Location based Services (LBS) in all its interdisciplinary aspects.	A series of activities (conferences, workshops, publications) has been organized to foster research and collaboration related to all aspects of LBS. See below for some main ones.
Maintain the commission website and update it regularly to allow commission members to exchange information, as well as to disseminate information on activities in this field to a wider public. Maintain the commission E-Mail list for the exchange of activities, knowledge, news, and information on LBS.	<ul style="list-style-type: none"> • Commission website: http://lbs.icaci.org/ • Commission E-mailing list: ica_com_lbs@googlegroups.com
Update the LBS Research Agenda to reflect the new challenges brought by	A updated version of the research agenda, with a focus on the context modelling and processing, is currently under

the new technological development, scientific advancement and societal changes.	review.
Organise ICC sessions, workshops and international conferences on LBS for colleagues from various disciplines to meet, and share research findings, ideas, and plans on how LBS can and could be improved and on how it will influence both science and society.	<p>Conferences/workshops/ICC sessions organized:</p> <ul style="list-style-type: none"> • International Conferences on LBS: LBS 2019, LBS 2021, LBS 2022 and LBS 2023 (https://lbs.icaci.org/lbs-conferences/) • LBS sessions at ICC 2021 and ICC 2023 • Pre-ICC 2021 Symposium on Geospatial Approaches to Combating Covid-19 (https://lbs.icaci.org/locbigdata/) • Pre-ICC 2023 Symposium on Location Based Big Data and GeoAI (https://lbs.icaci.org/locbigdata2023/)
Publish LBS-related reports, books and special issues with scientific journals.	<ul style="list-style-type: none"> • 3 journal special issues (see above): JLBS, CEUS, EPB • 4 Online conference proceedings
Encourage interdisciplinary and international collaboration with cognate disciplines and relevant stakeholders, including other ICA commissions and working groups, and other allied research communities (e.g., ISPRS, FIG, IAG), mainly through joint meetings, seminars, and publications.	<ul style="list-style-type: none"> • Collaboration with other ICA Commissions on “Geospatial Analysis and Modelling”, “Use, User, and Usability Issues”, “Cognitive Visualization” for organizing pre-ICC workshops at ICC 2021 and ICC 2023 • Collaboration with ISPRS, FIG, IAG, AGILE, and DGfK for the organization of LBS conferences

5. Summary

Overall, between 2019-2023, the LBS Commission has fulfilled the list of tasks and activities defined in the Terms of Reference. We have now built a strong and comprehensive platform for colleagues from various disciplines and practice to meet, interact and exchange knowledge, experience, plans and ideas on how LBS can and could be improved and on how it will influence both science and society.



**ICA Commission on
Location Based Services**