

15th International Conference on Spatial Information Theory

COSIT 2022, September 5–9, 2022, Kobe, Japan

Edited by

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ACM Classification 2012

Information systems → Geographic information systems; Applied computing → Transportation

ISBN 978-3-95977-257-0

Published online and open access by

Schloss Dagstuhl – Leibniz-Zentrum für Informatik GmbH, Dagstuhl Publishing, Saarbrücken/Wadern, Germany. Online available at <https://www.dagstuhl.de/dagpub/978-3-95977-257-0>.

Publication date

September, 2022

Bibliographic information published by the Deutsche Nationalbibliothek

The Deutsche Nationalbibliothek lists this publication in the Deutsche Nationalbibliografie; detailed bibliographic data are available in the Internet at <https://portal.dnb.de>.

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Digital Object Identifier: 10.4230/LIPIcs.COSIT.2022.0

ISBN 978-3-95977-257-0

ISSN 1868-8969

<https://www.dagstuhl.de/lipics>

LIPICs – Leibniz International Proceedings in Informatics

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■ Preface

Established in 1993¹, COSIT is a biennial international conference series concerned with theoretical aspects of space and spatial information. COSIT grew out of a series of workshops, NATO Advanced Study Institutes and NSF specialist meetings, all concerned with cognitive and applied aspects of representing large scale space, particularly geographic space. In these meetings, the need for a well-founded theory on spatial information processing was identified, and COSIT was formed in order to provide the platform for the intensive interdisciplinary scientific exchange on this theory. Since its inception, COSIT continuously attracted like-minded scientists from computer science, geography, cognitive science, philosophy and geomatics. Out of this interdisciplinary community grew journals such as *Spatial Cognition and Computation* (Taylor and Francis) and the open access *Journal of Spatial Information Science*. Originally, COSIT proceedings were published in Springer's *Lecture Notes in Computer Science* series. Since 2017 COSIT proceedings appear open-access in the *Leibniz International Proceedings in Informatics* series.

The first two COSIT conferences, 1993 and 1995, were held in Europe, to then turn into a truly international enterprise, held every second year in principle between locations in Europe and America. With Kobe, Japan, as the host city 2022, the 15th International Conference on Spatial Information Theory has been located for the first time in Asia. COSIT 2022 aimed to rekindle the well established COSIT spirit after a long, pandemic-caused hibernation. This spirit is based on the serendipity of a single-track meeting, of in-depth discussions of innovative and significant recent contributions, and of gathering new collaborations of interdisciplinary research amongst on-site participants.

International borders not yet open, COSIT 2022 dared to bet on a chiefly on-site event, which was supported by the distance in time and space from both Europe and America: A hybrid participation was thus only offered for the early morning or late evening paper presentation sessions. However, at the time of writing this Preface, we do not know yet whether border closures will be lifted in time for the conference. At least this volume of proceedings will document in writing the current state of research in the broad scientific communities dealing with spatial information theory.

Despite various uncertainties COSIT 2022 aims again to bring together scientists with various disciplinary backgrounds to extensively discuss the interdisciplinary state-of-the-art in theoretical aspects of space and spatial information, in order to advance geographic information science and its emerging research frontiers. This aim is facilitated by the on-site presentation and discussion of a restricted number of papers and posters -- the most innovative and significant recent contributions -- rather than papers covering incremental advances in one field. The conference offered three (refereed) submission tracks: vision papers, full papers, and short papers, which are collected in this volume of proceedings.

We received 13 full paper submissions, 33 short paper submissions and 4 vision paper submissions. The latter category, introduced at COSIT 2019, aimed at rigorously researched and argued agenda-setting ideas that identify emerging research frontiers, and/or societally relevant research problems that are complex or hard to solve.

¹ In 1992, Andrew Frank organized a successful international conference on “GIS–From Space to Territory: Theories and Methods for Spatio-Temporal Reasoning”, in hindsight referred to as COSIT Zero.



All submissions were thoroughly reviewed, in the large majority by at least three Program Committee members. Nine full papers, 18 short papers and two vision papers were selected for this volume (approx. 58% acceptance rate), and further five short papers were selected for presentation only.

The breadth of the topics in this volume also reflects the breadth of the disciplines involved in fundamental research related to geographic information theory. Excitingly, traditional research topics such as space-time representations, spatial relations, navigation, or (strong) spatial cognition are still alive and well. Empirical research on how to extract and analyze spatial information from rapidly growing user-generated online multimedia databases, for example, produced in a citizen science context, has clearly emerged as a new and popular research frontier in the field. Meanwhile, “big picture” theories and human behavioral studies have recently yielded fewer contributions (although still represented herein), despite being of great value to this interdisciplinary field.

Organizing any conference is not possible without the commitment, effort, and help of many people involved. The conference organizing team, fully aware of these uncertain times for on-site conferencing and its impact on budgeting, submission numbers, and participation, particularly wishes to thank the numerous researchers submitting their best ideas in hope of on-site discussions, the program committee thoroughly reviewing submissions in short time frames, the local organizing team for their flexibility and courage of planning an exciting conference, the keynote speakers willing to travel despite their full calendars and current travel risks, and . . . all the participants at the conference for their lively discussions, should the conference indeed take place as planned.

The conference organizers gratefully acknowledge the trust and support of the conference sponsors to make COSIT 2022 happen in Kobe, Japan. COSIT 2022 is supported by the Association of Geographic Information Laboratories in Europe (AGILE), Platinum Sponsorship, the American Association of Geographers (AAG), Bronze Sponsorship, Taylor & Francis with the International Journal of Geographical Information Science, Bronze Sponsorship, the Toyo University’s Department of Information Networking for Innovation and Design (INIAD) with its collaboration hub for University and Business (cHUB), the Kwansai Gakuin University, the Geographic Information Systems Association of Japan, and the Association of Japanese Geographers.

Tokyo, 24 May 2022

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